



SEQUENCE LISTING

<110> Slater, Michael
Huang, Fen
Hartnett, James

<120> Mutant TNE Polymerases

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<141> 2000-08-18

<150> 09/385,986

<151> 1999-08-30

<150> 08/484,661

<151> 1995-06-07

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<170> PatentIn version 3.0

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 His Asp Glu Leu Val Phe Glu Val Pro Asp Glu Glu Lys Glu Glu Leu
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aag ggc tac gtc agg act ctc ttt gga aga aaa aga gat att ccc cag Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln 500 505 510	1536
ctc atg gca agg gac aag aac acc cag tcc gaa ggc gaa aga atc gca Leu Met Ala Arg Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala 515 520 525	1584
ata aac acc ccc att cag gga acg gcg gca gat ata ata aaa ttg gct Ile Asn Thr Pro Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala 530 535 540	1632
atg ata gat ata gac gag gag ctg aga aaa aga aac atg aaa tcc aga Met Ile Asp Ile Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg 545 550 555 560	1680

atg atc att cag gtt cat gac gaa ctg gtc ttc gag gtt ccc gat gag	1728
Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu	
565 570 575	

gaa aaa gaa gaa cta gtt gat ctg gtg aag aac aaa atg aca aat gtg	1776
Glu Lys Glu Glu Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val	
580 585 590	

gtg aaa ctc tct gtg cct ctt gag gtt gac ata agc atc gga aaa agc	1824
Val Lys Leu Ser Val Pro Leu Glu Val Asp Ile Ser Ile Gly Lys Ser	
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Trp Ser	
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Glu Val Pro Ser Phe Ala Leu Asp Leu Glu Thr Ser Ser Leu Asp Pro
35 40 45

Phe Asn Cys Glu Ile Val Gly Ile Ser Val Ser Phe Lys Pro Lys Thr
50 55 60

Ala Tyr Tyr Ile Pro Leu His His Arg Asn Ala Gln Asn Leu Asp Glu
65 70 75 80

Thr Leu Val Leu Ser Lys Leu Lys Glu Ile Leu Glu Asp Pro Ser Ser
85 90 95

Lys Ile Val Gly Gln Asn Leu Lys Tyr Asp Tyr Lys Val Leu Met Val
100 105 110

Lys Gly Ile Ser Pro Val Tyr Pro His Phe Asp Thr Met Ile Ala Ala
115 120 125

Tyr Leu Leu Glu Pro Asn Glu Lys Lys Phe Asn Leu Glu Asp Leu Ser
 130 135 140

Leu Lys Phe Leu Gly Tyr Lys Met Thr Ser Tyr Gln Glu Leu Met Ser
 145 150 155 160

Phe Ser Ser Pro Leu Phe Gly Phe Ser Phe Ala Asp Val Pro Val Asp
 165 170 175

Lys Ala Ala Asn Tyr Ser Cys Glu Asp Ala Asp Ile Thr Tyr Arg Leu
 180 185 190

Tyr Lys Ile Leu Ser Met Lys Leu His Glu Ala Glu Leu Glu Asn Val
 195 200 205

Phe Tyr Arg Ile Glu Met Pro Leu Val Asn Val Leu Ala Arg Met Glu
 210 215 220

Leu Asn Gly Val Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu
 225 230 235 240

Glu Tyr Gly Lys Lys Leu Glu Glu Leu Ala Glu Lys Ile Tyr Gln Ile
 245 250 255

Ala Gly Glu Pro Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile
 260 265 270

Leu Phe Glu Lys Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr
 275 280 285

Gly Ala Tyr Ser Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu
 290 295 300

His Glu Ile Val Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu
 305 310 315 320

Lys Ser Thr Tyr Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr
 325 330 335

Gly Arg Ile His Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg
 340 345 350

Leu Ser Ser Ser Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu
 355 360 365

Glu Gly Lys Glu Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp
 370 375 380

Trp Ile Val Ser Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala
 385 390 395 400

His Leu Ser Gly Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile
 405 410 415

Asp Val His Thr Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu
 420 425 430

Glu Val Asn Glu Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser
 435 440 445

Ile Ile Tyr Gly Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile
 450 455 460

Pro Val Lys Glu Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr
 465 470 475 480

Pro Lys Val Arg Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu
 485 490 495

Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln
 500 505 510

Leu Met Ala Arg Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala
 515 520 525

Ile Asn Thr Pro Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala
 530 535 540

Met Ile Asp Ile Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg
 545 550 555 560

Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu
 565 570 575

Glu Lys Glu Glu Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val
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Val Lys Leu Ser Val Pro Leu Glu Val Asp Ile Ser Ile Gly Lys Ser
 595 600 605

Trp Ser
 610

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ttc aac tgt gag ata gtc ggc atc tcc gtg tcg ttc aaa ccg aaa aca 96
Phe Asn Cys Glu Ile Val Gly Ile Ser Val Ser Phe Lys Pro Lys Thr
20 25 30

gct tat tac att cca ctt cat cac aga aac gcc cag aat ctt gat gaa 144
Ala Tyr Tyr Ile Pro Leu His His Arg Asn Ala Gln Asn Leu Asp Glu
35 40 45

aca ctg gtg ctg tcg aag ttg aaa gag atc ctc gaa gac ccg tct tcg 192
Thr Leu Val Leu Ser Lys Leu Lys Glu Ile Leu Glu Asp Pro Ser Ser
50 55 60

aag att gtg ggt cag aac ctg aag tac gac tac aag gtt ctt atg gta 240
Lys Ile Val Gly Gln Asn Leu Lys Tyr Asp Tyr Lys Val Leu Met Val
65 70 75 80

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aag ggt ata tcg cca gtt tat ccg cat ttt gac acg atg ata gct gca	288
Lys Gly Ile Ser Pro Val Tyr Pro His Phe Asp Thr Met Ile Ala Ala	
85 90 95	
tat ttg ctg gag cca aac gag aaa aaa ttc aat ctc gaa gat ctg tct	336
Tyr Leu Leu Glu Pro Asn Glu Lys Lys Phe Asn Leu Glu Asp Leu Ser	
100 105 110	
ttg aaa ttt ctc gga tac aaa atg acg tct tat cag gaa ctg atg tcg	384
Leu Lys Phe Leu Gly Tyr Lys Met Thr Ser Tyr Gln Glu Leu Met Ser	
115 120 125	
ttt tcc tca cca ctt ttt ggt ttc agc ttt gcg gat gtt ccg gta gac	432
Phe Ser Ser Pro Leu Phe Gly Phe Ser Phe Ala Asp Val Pro Val Asp	
130 135 140	
aag gct gcg aac tac tcc tgc gag gat gca gac atc act tat agg ctc	480
Lys Ala Ala Asn Tyr Ser Cys Glu Asp Ala Asp Ile Thr Tyr Arg Leu	
145 150 155 160	
tac aag ata ctc agc atg aag ctc cat gaa gcg gaa ctt gag aac gtc	528
Tyr Lys Ile Leu Ser Met Lys Leu His Glu Ala Glu Leu Glu Asn Val	
165 170 175	
ttc tac agg ata gag atg ccg ctt gtg aac gtt ctt gca cgc atg gaa	576
Phe Tyr Arg Ile Glu Met Pro Leu Val Asn Val Leu Ala Arg Met Glu	
180 185 190	
ttg aac ggg gtg tat gtg gac aca gaa ttc ctg aaa aag ctc tcg gag	624
Leu Asn Gly Val Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu	
195 200 205	
gag tac ggc aaa aag ctc gag gaa ctg gcc gaa aaa atc tac cag ata	672
Glu Tyr Gly Lys Lys Leu Glu Glu Leu Ala Glu Lys Ile Tyr Gln Ile	
210 215 220	
gca gga gag ccc ttc aac atc aat tct cca aaa cag gtt tca aag atc	720
Ala Gly Glu Pro Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile	
225 230 235 240	
ctt ttt gag aag ctg gga ata aaa ccc cgt gga aaa acg aca aaa aca	768
Leu Phe Glu Lys Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr	
245 250 255	
gga gcg tac tct acc agg ata gag gtg ttg gaa gag ata gcg aat gag	816
Gly Ala Tyr Ser Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu	
260 265 270	
cac gag ata gta ccc ctc att ctc gag tac aga aag atc cag aaa ctg	864
His Glu Ile Val Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu	
275 280 285	
aaa tcg acc tac ata gac acc ctt ccg aaa ctt gtg aac ccg aaa acc	912
Lys Ser Thr Tyr Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr	
290 295 300	
gga aga att cat gca tct ttc cac cag acg ggt acc gcc act ggc agg	960
Gly Arg Ile His Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg	
305 310 315 320	

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Leu Ser Ser Ser Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu	
325 330 335	
gag gga aaa gaa att aga aaa gcg att gtg ccc cag gat cca gac tgg	1056
Glu Gly Lys Glu Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp	
340 345 350	
tgg atc gtc agt gcg gat tat tcc caa ata gaa ctc aga atc ctc gct	1104
Trp Ile Val Ser Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala	
355 360 365	
cat ctc agt ggt gat gag aac ctt gtg aag gcc ttc gag gag ggc atc	1152
His Leu Ser Gly Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile	
370 375 380	
gat gtg cac acc ttg act gcc tcc agg atc tac aac gta aag cca gaa	1200
Asp Val His Thr Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu	
385 390 395 400	
gaa gtg aac gaa gaa atg cga cgg gtt gga aag atg gtg aac ttc tct	1248
Glu Val Asn Glu Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser	
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ata ata tac ggt gtc aca ccg tac ggt ctt tct gtg aga ctt gga ata	1296
Ile Ile Tyr Gly Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile	
420 425 430	
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Pro Val Lys Glu Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr	
435 440 445	
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Pro Lys Val Arg Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu	
450 455 460	
aag ggc tac gtc agg act ctc ttt gga aga aaa aga gat att ccc cag	1440
Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln	
465 470 475 480	
ctc atg gca agg gac aag aac acc cag tcc gaa ggc gaa aga atc gca	1488
Leu Met Ala Arg Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala	
485 490 495	
ata aac acc ccc att cag gga acg gcg gca gat ata ata aaa ttg gct	1536
Ile Asn Thr Pro Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala	
500 505 510	
atg ata gat ata gac gag gag ctg aga aaa aga aac atg aaa tcc aga	1584
Met Ile Asp Ile Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg	
515 520 525	
atg atc att cag gtt cat gac gaa ctg gtc ttc gag gtt ccc gat gag	1632
Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu	
530 535 540	
gaa aaa gaa gaa cta gtt gat ctg gtg aag aac aaa atg aca aat gtg	1680
Glu Lys Glu Glu Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val	
545 550 555 560	

gtg aaa ctc tct gtg cct ctt gag gtt gac ata agc atc gga aaa agc 1728
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 35 40 45

Thr Leu Val Leu Ser Lys Leu Lys Glu Ile Leu Glu Asp Pro Ser Ser
 50 55 60

Lys Ile Val Gly Gln Asn Leu Lys Tyr Asp Tyr Lys Val Leu Met Val
 65 70 75 80

Lys Gly Ile Ser Pro Val Tyr Pro His Phe Asp Thr Met Ile Ala Ala
 85 90 95

Tyr Leu Leu Glu Pro Asn Glu Lys Lys Phe Asn Leu Glu Asp Leu Ser
 100 105 110

Leu Lys Phe Leu Gly Tyr Lys Met Thr Ser Tyr Gln Glu Leu Met Ser
 115 120 125

Phe Ser Ser Pro Leu Phe Gly Phe Ser Phe Ala Asp Val Pro Val Asp
 130 135 140

Lys Ala Ala Asn Tyr Ser Cys Glu Asp Ala Asp Ile Thr Tyr Arg Leu
 145 150 155 160

Tyr Lys Ile Leu Ser Met Lys Leu His Glu Ala Glu Leu Glu Asn Val
165 170 175

Phe Tyr Arg Ile Glu Met Pro Leu Val Asn Val Leu Ala Arg Met Glu
180 185 190

Leu Asn Gly Val Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu
195 200 205

Glu Tyr Gly Lys Lys Leu Glu Glu Leu Ala Glu Lys Ile Tyr Gln Ile
210 215 220

Ala Gly Glu Pro Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile
225 230 235 240

Leu Phe Glu Lys Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr
245 250 255

Gly Ala Tyr Ser Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu
260 265 270

His Glu Ile Val Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu
275 280 285

Lys Ser Thr Tyr Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr
290 295 300

Gly Arg Ile His Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg
305 310 315 320

Leu Ser Ser Ser Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu
325 330 335

Glu Gly Lys Glu Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp
340 345 350

Trp Ile Val Ser Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala
355 360 365

His Leu Ser Gly Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile
370 375 380

Asp Val His Thr Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu
385 390 395 400

Glu Val Asn Glu Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser
405 410 415

Ile Ile Tyr Gly Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile
420 425 430

Pro Val Lys Glu Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr
435 440 445

Pro Lys Val Arg Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu
450 455 460

Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln
465 470 475 480

Leu Met Ala Arg Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala
485 490 495

Ile Asn Thr Pro Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala
500 505 510

Met Ile Asp Ile Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg
515 520 525

Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu
530 535 540

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Trp Ser

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Ile Val Lys Asp His Lys Thr Phe Glu Asp Leu Ile Glu Lys Leu Lys		
20 25 30		
gag gtt cca tct ttt gcc ctg gaa ctt gaa acg tcc tcc ctt gac ccg		144
Glu Val Pro Ser Phe Ala Leu Glu Leu Glu Thr Ser Ser Leu Asp Pro		
35 40 45		
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Phe Asn Cys Glu Ile Val Gly Ile Ser Val Ser Phe Lys Pro Lys Thr		
50 55 60		
gct tat tac att cca ctt cat cac aga aac gcc cag aat ctt gat gaa		240
Ala Tyr Tyr Ile Pro Leu His His Arg Asn Ala Gln Asn Leu Asp Glu		
65 70 75 80		
aca ctg gtg ctg tcg aag ttg aaa gag atc ctc gaa gac ccg tct tcg		288
Thr Leu Val Leu Ser Lys Leu Lys Glu Ile Leu Glu Asp Pro Ser Ser		
85 90 95		
aag att gtg ggt cag aac ctg aag tac gac tac aag gtt ctt atg gta		336
Lys Ile Val Gly Gln Asn Leu Lys Tyr Asp Tyr Lys Val Leu Met Val		
100 105 110		
aag ggt ata tcg cca gtt tat ccg cat ttt gac acg atg ata gct gca		384
Lys Gly Ile Ser Pro Val Tyr Pro His Phe Asp Thr Met Ile Ala Ala		
115 120 125		
tat ttg ctg gag cca aac gag aaa aaa ttc aat ctc gaa gat ctg tct		432
Tyr Leu Leu Glu Pro Asn Glu Lys Lys Phe Asn Leu Glu Asp Leu Ser		
130 135 140		
ttg aaa ttt ctc gga tac aaa atg acg tct tat cag gaa ctg atg tcg		480
Leu Lys Phe Leu Gly Tyr Lys Met Thr Ser Tyr Gln Glu Leu Met Ser		
145 150 155 160		
ttt tcc tca cca ctt ttt ggt ttc agc ttt gcg gat gtt ccg gta gac		528
Phe Ser Ser Pro Leu Phe Gly Phe Ser Phe Ala Asp Val Pro Val Asp		
165 170 175		
aag gct gcg aac tac tcc tgc gag gat gca gac atc act tat agg ctc		576
Lys Ala Ala Asn Tyr Ser Cys Glu Asp Ala Asp Ile Thr Tyr Arg Leu		
180 185 190		
tac aag ata ctc agc atg aag ctc cat gaa gcg gaa ctt gag aac gtc		624
Tyr Lys Ile Leu Ser Met Lys Leu His Glu Ala Glu Leu Glu Asn Val		
195 200 205		
ttc tac agg ata gag atg ccg ctt gtg aac gtt ctt gca cgc atg gaa		672
Phe Tyr Arg Ile Glu Met Pro Leu Val Asn Val Leu Ala Arg Met Glu		
210 215 220		
ttg aac ggg gtg tat gtg gac aca gaa ttc ctg aaa aag ctc tcg gag		720
Leu Asn Gly Val Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu		
225 230 235 240		

gag tac ggc aaa aag ctc gag gaa ctg gcc gaa aaa atc tac cag ata	768
Glu Tyr Gly Lys Lys 245 Leu Glu Glu Leu 250 Ala Glu Lys Ile Tyr 255 Gln Ile	
gca gga gag ccc ttc aac atc aat tct cca aaa cag gtt tca aag atc	816
Ala Gly Glu Pro Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile	
ctt ttt gag aag ctg gga ata aaa ccc cgt gga aaa acg aca aaa aca	864
Leu Phe Glu Lys Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr	
275 280 285	
gga gcg tac tct acc agg ata gag gtg ttg gaa gag ata gcg aat gag	912
Gly Ala Tyr Ser Thr Arg Ile Glu Val Leu Glu Ile Ala Asn Glu	
290 295 300	
cac gag ata gta ccc ctc att ctc gag tac aga aag atc cag aaa ctg	960
His Glu Ile Val Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu	
305 310 315 320	
aaa tcg acc tac ata gac acc ctt ccg aaa ctt gtg aac ccg aaa acc	1008
Lys Ser Thr Tyr Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr	
325 330 335	
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Gly Arg Ile His Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg	
340 345 350	
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Glu Gly Lys Glu Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp	
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Trp Ile Val Ser Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala	
385 390 395 400	
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His Leu Ser Gly Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile	
405 410 415	
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Asp Val His Thr Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu	
420 425 430	
gaa gtg aac gaa gaa atg cga cgg gtt gga aag atg gtg aac ttc tct	1344
Glu Val Asn Glu Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser	
435 440 445	
ata ata tac ggt gtc aca ccg tac ggt ctt tct gtg aga ctt gga ata	1392
Ile Ile Tyr Gly Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile	
450 455 460	
ccg gtt aaa gaa gca gaa aag atg att atc agc tat ttc aca ctg tat	1440
Pro Val Lys Glu Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr	
465 470 475 480	

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Pro Lys Val Arg Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu	
485 490 495	
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Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln	
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Leu Met Ala Arg Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala	
515 520 525	
ata aac acc ccc att cag gga acg gcg gca gat ata ata aaa ttg gct	1632
Ile Asn Thr Pro Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala	
530 535 540	
atg ata gat ata gac gag gag ctg aga aaa aga aac atg aaa tcc aga	1680
Met Ile Asp Ile Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg	
545 550 555 560	
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Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu	
565 570 575	
gaa aaa gaa gaa cta gtt gat ctg gtg aag aac aaa atg aca aat gtg	1776
Glu Lys Glu Glu Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val	
580 585 590	
gtg aaa ctc tct gtg cct ctt gag gtt gac ata agc atc gga aaa agc	1824
Val Lys Leu Ser Val Pro Leu Glu Val Asp Ile Ser Ile Gly Lys Ser	
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tgg tct tga	1833
Trp Ser	
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35 40 45

Gly Ala Tyr Ser Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu
 290 295 300

His Glu Ile Val Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu
 305 310 315 320

Lys Ser Thr Tyr Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr
 325 330 335

Gly Arg Ile His Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg
 340 345 350

Leu Ser Ser Ser Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu
 355 360 365

Glu Gly Lys Glu Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp
 370 375 380

Trp Ile Val Ser Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala
 385 390 395 400

His Leu Ser Gly Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile
 405 410 415

Asp Val His Thr Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu
 420 425 430

Glu Val Asn Glu Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser
 435 440 445

Ile Ile Tyr Gly Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile
 450 455 460

Pro Val Lys Glu Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr
 465 470 475 480

Pro Lys Val Arg Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu
 485 490 495

Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln
 500 505 510

Leu Met Ala Arg Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala
 515 520 525

Ile Asn Thr Pro Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala
 530 535 540

Met Ile Asp Ile Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg
 545 550 555 560

Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu
 565 570 575

Glu Lys Glu Glu Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val
 580 585 590

Val Lys Leu Ser Val Pro Leu Glu Val Asp Ile Ser Ile Gly Lys Ser
 595 600 605

Trp Ser
 610

<210> 17

<211> 17

<212> DNA

<213> Artificial/Unknown

<220>

<221> misc_feature

<223> Synthetic

<400> 17

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17

<210> 18

<211> 1833

<212> DNA

<213> Artificial/Unknown

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<221> CDS

<222> (1)..(1830)

<400> 18

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 Met Lys Glu Leu Gln Leu Tyr Glu Glu Ala Glu Pro Thr Gly Tyr Glu
 1 5 10 15

48

atc gtg aag gat cat aag acc ttc gaa gat ctc atc gaa aag ctg aag Ile Val Lys Asp His Lys Thr Phe Glu Asp Leu Ile Glu Lys Leu Lys	96
20 25 30	
gag gtt cca tct ttt gcc ctg gac ctt gac acg tcc tcc ctt gac ccg Glu Val Pro Ser Phe Ala Leu Asp Leu Asp Thr Ser Ser Leu Asp Pro	144
35 40 45	
ttc aac tgt gag ata gtc ggc atc tcc gtg tcg ttc aaa ccg aaa aca Phe Asn Cys Glu Ile Val Gly Ile Ser Val Ser Phe Lys Pro Lys Thr	192
50 55 60	
gct tat tac att cca ctt cat cac aga aac gcc cag aat ctt gat gaa Ala Tyr Tyr Ile Pro Leu His His Arg Asn Ala Gln Asn Leu Asp Glu	240
65 70 75 80	
aca ctg gtg ctg tcg aag ttg aaa gag atc ctc gaa gac ccg tct tcg Thr Leu Val Leu Ser Lys Leu Lys Glu Ile Leu Glu Asp Pro Ser Ser	288
85 90 95	
aag att gtg ggt cag aac ctg aag tac gac tac aag gtt ctt atg gta Lys Ile Val Gly Gln Asn Leu Lys Tyr Asp Tyr Lys Val Leu Met Val	336
100 105 110	
aag ggt ata tcg cca gtt tat ccg cat ttt gac acg atg ata gct gca Lys Gly Ile Ser Pro Val Tyr Pro His Phe Asp Thr Met Ile Ala Ala	384
115 120 125	
tat ttg ctg gag cca aac gag aaa aaa ttc aat ctc gaa gat ctg tct Tyr Leu Leu Glu Pro Asn Glu Lys Lys Phe Asn Leu Glu Asp Leu Ser	432
130 135 140	
ttg aaa ttt ctc gga tac aaa atg acg tct tat cag gaa ctg atg tcg Leu Lys Phe Leu Gly Tyr Lys Met Thr Ser Tyr Gln Glu Leu Met Ser	480
145 150 155 160	
ttt tcc tca cca ctt ttt ggt ttc agc ttt gcg gat gtt ccg gta gac Phe Ser Ser Pro Leu Phe Gly Phe Ser Phe Ala Asp Val Pro Val Asp	528
165 170 175	
aag gct gcg aac tac tcc tgc gag gat gca gac atc act tat agg ctc Lys Ala Ala Asn Tyr Ser Cys Glu Asp Ala Asp Ile Thr Tyr Arg Leu	576
180 185 190	
tac aag ata ctc agc atg aag ctc cat gaa gcg gaa ctt gag aac gtc Tyr Lys Ile Leu Ser Met Lys Leu His Glu Ala Glu Leu Glu Asn Val	624
195 200 205	
ttc tac agg ata gag atg ccg ctt gtg aac gtt ctt gca cgc atg gaa Phe Tyr Arg Ile Glu Met Pro Leu Val Asn Val Leu Ala Arg Met Glu	672
210 215 220	
ttg aac ggg gtg tat gtg gac aca gaa ttc ctg aaa aag ctc tcg gag Leu Asn Gly Val Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu	720
225 230 235 240	
gag tac ggc aaa aag ctc gag gaa ctg gcc gaa aaa atc tac cag ata Glu Tyr Gly Lys Lys Leu Glu Glu Leu Ala Glu Lys Ile Tyr Gln Ile	768
245 250 255	

gca gga gag ccc ttc aac atc aat tct cca aaa cag gtt tca aag atc Ala Gly Glu Pro Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile 260 265 270	816
ctt ttt gag aag ctg gga ata aaa ccc cgt gga aaa acg aca aaa aca Leu Phe Glu Lys Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr 275 280 285	864
gga gcg tac tct acc agg ata gag gtg ttg gaa gag ata gcg aat gag Gly Ala Tyr Ser Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu 290 295 300	912
cac gag ata gta ccc ctc att ctc gag tac aga aag atc cag aaa ctg His Glu Ile Val Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu 305 310 315 320	960
aaa tcg acc tac ata gac acc ctt ccg aaa ctt gtg aac ccg aaa acc Lys Ser Thr Tyr Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr 325 330 335	1008
gga aga att cat gca tct ttc cac cag acg ggt acc gcc act ggc agg Gly Arg Ile His Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg 340 345 350	1056
ttg agt agc agt gat cca aat ctt cag aat ctt ccg aca aag agc gaa Leu Ser Ser Ser Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu 355 360 365	1104
gag gga aaa gaa att aga aaa gcg att gtg ccc cag gat cca gac tgg Glu Gly Lys Glu Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp 370 375 380	1152
tgg atc gtc agt gcg gat tat tcc caa ata gaa ctc aga atc ctc gct Trp Ile Val Ser Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala 385 390 395 400	1200
cat ctc agt ggt gat gag aac ctt gtg aag gcc ttc gag gag ggc atc His Leu Ser Gly Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile 405 410 415	1248
gat gtg cac acc ttg act gcc tcc agg atc tac aac gta aag cca gaa Asp Val His Thr Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu 420 425 430	1296
gaa gtg aac gaa gaa atg cga cgg gtt gga aag atg gtg aac ttc tct Glu Val Asn Glu Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser 435 440 445	1344
ata ata tac ggt gtc aca ccg tac ggt ctt tct gtg aga ctt gga ata Ile Ile Tyr Gly Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile 450 455 460	1392
ccg gtt aaa gaa gca gaa aag atg att atc agc tat ttc aca ctg tat Pro Val Lys Glu Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr 465 470 475 480	1440
cca aag gtg cga agc tac atc cag cag gtt gtt gca gag gca aaa gag Pro Lys Val Arg Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu 485 490 495	1488

aag ggc tac gtc agg act ctc ttt gga aga aaa aga gat att ccc cag	1536
Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln	
500 505 510	
ctc atg gca agg gac aag aac acc cag tcc gaa ggc gaa aga atc gca	1584
Leu Met Ala Arg Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala	
515 520 525	
ata aac acc ccc att cag gga acg gcg gca gat ata ata aaa ttg gct	1632
Ile Asn Thr Pro Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala	
530 535 540	
atg ata gat ata gac gag gag ctg aga aaa aga aac atg aaa tcc aga	1680
Met Ile Asp Ile Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg	
545 550 555 560	
atg atc att cag gtt cat gac gaa ctg gtc ttc gag gtt ccc gat gag	1728
Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu	
565 570 575	
gaa aaa gaa gaa cta gtt gat ctg gtg aag aac aaa atg aca aat gtg	1776
Glu Lys Glu Glu Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val	
580 585 590	
gtg aaa ctc tct gtg cct ctt gag gtt gac ata agc atc gga aaa agc	1824
Val Lys Leu Ser Val Pro Leu Glu Val Asp Ile Ser Ile Gly Lys Ser	
595 600 605	
tgg tct tga	1833
Trp Ser	
610	

<210> 19

<211> 610

<212> PRT

<213> Artificial/Unknown

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<223> Synthetic

<400> 19

Met Lys Glu Leu Gln Leu Tyr Glu Glu Ala Glu Pro Thr Gly Tyr Glu
1 5 10 15

Ile Val Lys Asp His Lys Thr Phe Glu Asp Leu Ile Glu Lys Leu Lys
20 25 30

Glu Val Pro Ser Phe Ala Leu Asp Leu Asp Thr Ser Ser Leu Asp Pro
35 40 45

Phe Asn Cys Glu Ile Val Gly Ile Ser Val Ser Phe Lys Pro Lys Thr
50 55 60

Ala Tyr Tyr Ile Pro Leu His His Arg Asn Ala Gln Asn Leu Asp Glu
 65 70 75 80

Thr Leu Val Leu Ser Lys Leu Lys Glu Ile Leu Glu Asp Pro Ser Ser
 85 90 95

Lys Ile Val Gly Gln Asn Leu Lys Tyr Asp Tyr Lys Val Leu Met Val
 100 105 110

Lys Gly Ile Ser Pro Val Tyr Pro His Phe Asp Thr Met Ile Ala Ala
 115 120 125

Tyr Leu Leu Glu Pro Asn Glu Lys Lys Phe Asn Leu Glu Asp Leu Ser
 130 135 140

Leu Lys Phe Leu Gly Tyr Lys Met Thr Ser Tyr Gln Glu Leu Met Ser
 145 150 155 160

Phe Ser Ser Pro Leu Phe Gly Phe Ser Phe Ala Asp Val Pro Val Asp
 165 170 175

Lys Ala Ala Asn Tyr Ser Cys Glu Asp Ala Asp Ile Thr Tyr Arg Leu
 180 185 190

Tyr Lys Ile Leu Ser Met Lys Leu His Glu Ala Glu Leu Glu Asn Val
 195 200 205

Phe Tyr Arg Ile Glu Met Pro Leu Val Asn Val Leu Ala Arg Met Glu
 210 215 220

Leu Asn Gly Val Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu
 225 230 235 240

Glu Tyr Gly Lys Lys Leu Glu Glu Leu Ala Glu Lys Ile Tyr Gln Ile
 245 250 255

Ala Gly Glu Pro Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile
 260 265 270

Leu Phe Glu Lys Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr
 275 280 285

Gly Ala Tyr Ser Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu
 290 295 300

His Glu Ile Val Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu
 305 310 315 320

Lys Ser Thr Tyr Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr
 325 330 335

Gly Arg Ile His Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg
 340 345 350

Leu Ser Ser Ser Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu
 355 360 365

Glu Gly Lys Glu Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp
 370 375 380

Trp Ile Val Ser Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala
 385 390 395 400

His Leu Ser Gly Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile
 405 410 415

Asp Val His Thr Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu
 420 425 430

Glu Val Asn Glu Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser
 435 440 445

Ile Ile Tyr Gly Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile
 450 455 460

Pro Val Lys Glu Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr
 465 470 475 480

Pro Lys Val Arg Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu
 485 490 495

Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln
 500 505 510

Leu Met Ala Arg Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala
 515 520 525

Ile Asn Thr Pro Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala
 530 535 540

Met Ile Asp Ile Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg
 545 550 555 560

Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu
565 570 575

Glu Lys Glu Glu Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val
580 585 590

Val Lys Leu Ser Val Pro Leu Glu Val Asp Ile Ser Ile Gly Lys Ser
595 600 605

Trp Ser
610

<210> 20

<211> 39

<212> DNA

<213> Artificial/Unknown

<220>

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<400> 20
taagtgatat ctgcatactc gcaggagaag ttcgcagcc

39

<210> 21

<211> 39

<212> DNA

<213> Artificial/Unknown

<220>

<221> misc_feature

<223> Synthetic

<400> 21
acaaggctgc gaacttctcc tgcgaggatg cagatatca

39

<210> 22

<211> 1833

<212> DNA

<213> Artificial/Unknown

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<222> (1)..(1830)

<400> 22

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Met Lys Glu Leu Gln Leu Tyr Glu Glu Ala Glu Pro Thr Gly Tyr Glu	
1 5 10 15	

atc gtg aag gat cat aag acc ttc gaa gat ctc atc gaa aag ctg aag	96
Ile Val Lys Asp His Lys Thr Phe Glu Asp Leu Ile Glu Lys Leu Lys	
20 25 30	

gag gtt cca tct ttt gcc ctg gac ctt gaa acg tcc tcc ctt gac ccg	144
Glu Val Pro Ser Phe Ala Leu Asp Leu Glu Thr Ser Ser Leu Asp Pro	
35 40 45	

ttc aac tgt gag ata gtc ggc atc tcc gtg tcg ttc aaa ccg aaa aca	192
Phe Asn Cys Glu Ile Val Gly Ile Ser Val Ser Phe Lys Pro Lys Thr	
50 55 60	

gct tat tac att cca ctt cat cac aga aac gcc cag aat ctt gat gaa	240
Ala Tyr Tyr Ile Pro Leu His His Arg Asn Ala Gln Asn Leu Asp Glu	
65 70 75 80	

aca ctg gtg ctg tcg aag ttg aaa gag atc ctc gaa gac ccg tct tcg	288
Thr Leu Val Leu Ser Lys Leu Lys Glu Ile Leu Glu Asp Pro Ser Ser	
85 90 95	

aag att gtg ggt cag aac ctg aag tac gac tac aag gtt ctt atg gta	336
Lys Ile Val Gly Gln Asn Leu Lys Tyr Asp Tyr Lys Val Leu Met Val	
100 105 110	

aag ggt ata tcg cca gtt tat ccg cat ttt gac acg atg ata gct gca	384
Lys Gly Ile Ser Pro Val Tyr Pro His Phe Asp Thr Met Ile Ala Ala	
115 120 125	

tat ttg ctg gag cca aac gag aaa aaa ttc aat ctc gaa gat ctg tct	432
Tyr Leu Leu Glu Pro Asn Glu Lys Lys Phe Asn Leu Glu Asp Leu Ser	
130 135 140	

ttg aaa ttt ctc gga tac aaa atg acg tct tat cag gaa ctg atg tcg	480
Leu Lys Phe Leu Gly Tyr Lys Met Thr Ser Tyr Gln Glu Leu Met Ser	
145 150 155 160	

ttt tcc tca cca ctt ttt ggt ttc agc ttt gcg gat gtt ccg gta gac	528
Phe Ser Ser Pro Leu Phe Gly Phe Ser Phe Ala Asp Val Pro Val Asp	
165 170 175	

aag gct gcg aac ttc tcc tgc gag gat gca gat atc act tat agg ctc	576
Lys Ala Ala Asn Phe Ser Cys Glu Asp Ala Asp Ile Thr Tyr Arg Leu	
180 185 190	

tac aag ata ctc agc atg aag ctc cat gaa gcg gaa ctt gag aac gtc	624
Tyr Lys Ile Leu Ser Met Lys Leu His Glu Ala Glu Leu Glu Asn Val	
195 200 205	

ttc tac agg ata gag atg ccg ctt gtg aac gtt ctt gca cgc atg gaa Phe Tyr Arg Ile Glu Met Pro Leu Val Asn Val Leu Ala Arg Met Glu 210 215 220	672
ttg aac ggg gtg tat gtg gac aca gaa ttc ctg aaa aag ctc tcg gag Leu Asn Gly Val Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu 225 230 235 240	720
gag tac ggc aaa aag ctc gag gaa ctg gcc gaa aaa atc tac cag ata Glu Tyr Gly Lys Lys Leu Glu Glu Leu Ala Glu Lys Ile Tyr Gln Ile 245 250 255	768
gca gga gag ccc ttc aac atc aat tct cca aaa cag gtt tca aag atc Ala Gly Glu Pro Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile 260 265 270	816
ctt ttt gag aag ctg gga ata aaa ccc cgt gga aaa acg aca aaa aca Leu Phe Glu Lys Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr 275 280 285	864
gga gcg tac tct acc agg ata gag gtg ttg gaa gag ata gcg aat gag Gly Ala Tyr Ser Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu 290 295 300	912
cac gag ata gta ccc ctc att ctc gag tac aga aag atc cag aaa ctg His Glu Ile Val Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu 305 310 315 320	960
aaa tcg acc tac ata gac acc ctt ccg aaa ctt gtg aac ccg aaa acc Lys Ser Thr Tyr Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr 325 330 335	1008
gga aga att cat gca tct ttc cac cag acg ggt acc gcc act ggc agg Gly Arg Ile His Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg 340 345 350	1056
ttg agt agc agt gat cca aat ctt cag aat ctt ccg aca aag agc gaa Leu Ser Ser Ser Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu 355 360 365	1104
gag gga aaa gaa att aga aaa gcg att gtg ccc cag gat cca gac tgg Glu Gly Lys Glu Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp 370 375 380	1152
tgg atc gtc agt gcg gat tat tcc caa ata gaa ctc aga atc ctc gct Trp Ile Val Ser Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala 385 390 395 400	1200
cat ctc agt ggt gat gag aac ctt gtg aag gcc ttc gag gag ggc atc His Leu Ser Gly Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile 405 410 415	1248
gat gtg cac acc ttg act gcc tcc agg atc tac aac gta aag cca gaa Asp Val His Thr Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu 420 425 430	1296
gaa gtg aac gaa gaa atg cga cgg gtt gga aag atg gtg aac ttc tct Glu Val Asn Glu Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser 435 440 445	1344

ata ata tac ggt gtc aca ccg tac ggt ctt tct gtg aga ctt gga ata Ile Ile Tyr Gly Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile 450 455 460	1392
ccg gtt aaa gaa gca gaa aag atg att atc agc tat ttc aca ctg tat Pro Val Lys Glu Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr 465 470 475 480	1440
cca aag gtg cga agc tac atc cag cag gtt gtt gca gag gca aaa gag Pro Lys Val Arg Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu 485 490 495	1488
aag ggc tac gtc agg act ctc ttt gga aga aaa aga gat att ccc cag Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Pro Gln 500 505 510	1536
ctc atg gca agg gac aag aac acc cag tcc gaa ggc gaa aga atc gca Leu Met Ala Arg Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala 515 520 525	1584
ata aac acc ccc att cag gga acg gcg gca gat ata ata aaa ttg gct Ile Asn Thr Pro Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala 530 535 540	1632
atg ata gat ata gac gag gag ctg aga aaa aga aac atg aaa tcc aga Met Ile Asp Ile Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg 545 550 555 560	1680
atg atc att cag gtt cat gac gaa ctg gtc ttc gag gtt ccc gat gag Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu 565 570 575	1728
gaa aaa gaa gaa cta gtt gat ctg gtg aag aac aaa atg aca aat gtg Glu Lys Glu Glu Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val 580 585 590	1776
gtg aaa ctc tct gtg cct ctt gag gtt gac ata agc atc gga aaa agc Val Lys Leu Ser Val Pro Leu Glu Val Asp Ile Ser Ile Gly Lys Ser 595 600 605	1824
tgg tct tga Trp Ser 610	1833
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<211> 610	
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<400> 23

Met Lys Glu Leu Gln Leu Tyr Glu Glu Ala Glu Pro Thr Gly Tyr Glu
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Ile Val Lys Asp His Lys Thr Phe Glu Asp Leu Ile Glu Lys Leu Lys
20 25 30

Glu Val Pro Ser Phe Ala Leu Asp Leu Glu Thr Ser Ser Leu Asp Pro
35 40 45

Phe Asn Cys Glu Ile Val Gly Ile Ser Val Ser Phe Lys Pro Lys Thr
50 55 60

Ala Tyr Tyr Ile Pro Leu His His Arg Asn Ala Gln Asn Leu Asp Glu
65 70 75 80

Thr Leu Val Leu Ser Lys Leu Lys Glu Ile Leu Glu Asp Pro Ser Ser
85 90 95

Lys Ile Val Gly Gln Asn Leu Lys Tyr Asp Tyr Lys Val Leu Met Val
100 105 110

Lys Gly Ile Ser Pro Val Tyr Pro His Phe Asp Thr Met Ile Ala Ala
115 120 125

Tyr Leu Leu Glu Pro Asn Glu Lys Lys Phe Asn Leu Glu Asp Leu Ser
130 135 140

Leu Lys Phe Leu Gly Tyr Lys Met Thr Ser Tyr Gln Glu Leu Met Ser
145 150 155 160

Phe Ser Ser Pro Leu Phe Gly Phe Ser Phe Ala Asp Val Pro Val Asp
165 170 175

Lys Ala Ala Asn Phe Ser Cys Glu Asp Ala Asp Ile Thr Tyr Arg Leu
180 185 190

Tyr Lys Ile Leu Ser Met Lys Leu His Glu Ala Glu Leu Glu Asn Val
195 200 205

Phe Tyr Arg Ile Glu Met Pro Leu Val Asn Val Leu Ala Arg Met Glu
210 215 220

Leu Asn Gly Val Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu
225 230 235 240

Glu Tyr Gly Lys Lys Leu Glu Glu Leu Ala Glu Lys Ile Tyr Gln Ile
 245 250 255
 Ala Gly Glu Pro Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile
 260 265 270
 Leu Phe Glu Lys Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr
 275 280 285
 Gly Ala Tyr Ser Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu
 290 295 300
 His Glu Ile Val Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu
 305 310 315 320
 Lys Ser Thr Tyr Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr
 325 330 335
 Gly Arg Ile His Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg
 340 345 350
 Leu Ser Ser Ser Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu
 355 360 365
 Glu Gly Lys Glu Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp
 370 375 380
 Trp Ile Val Ser Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala
 385 390 395 400
 His Leu Ser Gly Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile
 405 410 415
 Asp Val His Thr Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu
 420 425 430
 Glu Val Asn Glu Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser
 435 440 445
 Ile Ile Tyr Gly Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile
 450 455 460
 Pro Val Lys Glu Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr
 465 470 475 480
 Pro Lys Val Arg Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu
 485 490 495

Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln
500 505 510

Leu Met Ala Arg Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala
515 520 525

Ile Asn Thr Pro Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala
530 535 540

Met Ile Asp Ile Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg
545 550 555 560

Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu
565 570 575

Glu Lys Glu Glu Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val
580 585 590

Val Lys Leu Ser Val Pro Leu Glu Val Asp Ile Ser Ile Gly Lys Ser
595 600 605

Trp Ser
610

<210> 24

<211> 32

<212> DNA

<213> Artificial/Unknown

<220>

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<223> Synthetic

<400> 24

actcctgcga gaatgctgac atcacttata gg

32

<210> 25

<211> 1833

<212> DNA

<213> Artificial/Unknown

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<223> Synthetic

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<221> CDS

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<400> 25

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Met	Lys	Glu	Leu	Gln	Leu	Tyr	Glu	Glu	Ala	Glu	Pro	Thr	Gly	Tyr	Glu	
1				5					10						15	

atc	gtg	aag	gat	cat	aag	acc	ttc	gaa	gat	ctc	atc	gaa	aag	ctg	aag	96
Ile	Val	Lys	Asp	His	Lys	Thr	Phe	Glu	Asp	Leu	Ile	Glu	Lys	Leu	Lys	
			20					25					30			

gag	gtt	cca	tct	ttt	gcc	ctg	gac	ctt	gaa	acg	tcc	tcc	ctt	gac	ccg	144
Glu	Val	Pro	Ser	Phe	Ala	Leu	Asp	Leu	Glu	Thr	Ser	Ser	Leu	Asp	Pro	
		35					40					45				

ttc	aac	tgt	gag	ata	gtc	ggc	atc	tcc	gtg	tcg	ttc	aaa	ccg	aaa	aca	192
Phe	Asn	Cys	Glu	Ile	Val	Gly	Ile	Ser	Val	Ser	Phe	Lys	Pro	Lys	Thr	
	50					55					60					

gct	tat	tac	att	cca	ctt	cat	cac	aga	aac	gcc	cag	aat	ctt	gat	gaa	240
Ala	Tyr	Tyr	Ile	Pro	Leu	His	His	Arg	Asn	Ala	Gln	Asn	Leu	Asp	Glu	
65					70					75					80	

aca	ctg	gtg	ctg	tcg	aag	ttg	aaa	gag	atc	ctc	gaa	gac	ccg	tct	tcg	288
Thr	Leu	Val	Leu	Ser	Lys	Leu	Lys	Glu	Ile	Leu	Glu	Asp	Pro	Ser	Ser	
				85					90					95		

aag	att	gtg	ggt	cag	aac	ctg	aag	tac	gac	tac	aag	gtt	ctt	atg	gta	336
Lys	Ile	Val	Gly	Gln	Asn	Leu	Lys	Tyr	Asp	Tyr	Lys	Val	Leu	Met	Val	
			100					105					110			

aag	ggt	ata	tcg	cca	gtt	tat	ccg	cat	ttt	gac	acg	atg	ata	gct	gca	384
Lys	Gly	Ile	Ser	Pro	Val	Tyr	Pro	His	Phe	Asp	Thr	Met	Ile	Ala	Ala	
		115					120					125				

tat	ttg	ctg	gag	cca	aac	gag	aaa	aaa	ttc	aat	ctc	gaa	gat	ctg	tct	432
Tyr	Leu	Leu	Glu	Pro	Asn	Glu	Lys	Lys	Phe	Asn	Leu	Glu	Asp	Leu	Ser	
	130					135					140					

ttg	aaa	ttt	ctc	gga	tac	aaa	atg	acg	tct	tat	cag	gaa	ctg	atg	tcg	480
Leu	Lys	Phe	Leu	Gly	Tyr	Lys	Met	Thr	Ser	Tyr	Gln	Glu	Leu	Met	Ser	
145				150					155						160	

ttt	tcc	tca	cca	ctt	ttt	ggt	ttc	agc	ttt	gcg	gat	gtt	ccg	gta	gac	528
Phe	Ser	Ser	Pro	Leu	Phe	Gly	Phe	Ser	Phe	Ala	Asp	Val	Pro	Val	Asp	
				165				170						175		

aag	gct	gcg	aac	tac	tcc	tgc	gag	aat	gct	gac	atc	act	tat	agg	ctc	576
Lys	Ala	Ala	Asn	Tyr	Ser	Cys	Glu	Asn	Ala	Asp	Ile	Thr	Tyr	Arg	Leu	
			180					185					190			

tac	aag	ata	ctc	agc	atg	aag	ctc	cat	gaa	gcg	gaa	ctt	gag	aac	gtc	624
Tyr	Lys	Ile	Leu	Ser	Met	Lys	Leu	His	Glu	Ala	Glu	Leu	Glu	Asn	Val	
		195					200					205				

ttc tac agg ata gag atg ccg ctt gtg aac gtt ctt gca cgc atg gaa Phe Tyr Arg Ile Glu Met Pro Leu Val Asn Val Leu Ala Arg Met Glu 210 215 220	672
ttg aac ggg gtg tat gtg gac aca gaa ttc ctg aaa aag ctc tcg gag Leu Asn Gly Val Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu 225 230 235 240	720
gag tac ggc aaa aag ctc gag gaa ctg gcc gaa aaa atc tac cag ata Glu Tyr Gly Lys Lys Leu Glu Glu Leu Ala Glu Lys Ile Tyr Gln Ile 245 250 255	768
gca gga gag ccc ttc aac atc aat tct cca aaa cag gtt tca aag atc Ala Gly Glu Pro Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile 260 265 270	816
ctt ttt gag aag ctg gga ata aaa ccc cgt gga aaa acg aca aaa aca Leu Phe Glu Lys Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr 275 280 285	864
gga gcg tac tct acc agg ata gag gtg ttg gaa gag ata gcg aat gag Gly Ala Tyr Ser Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu 290 295 300	912
cac gag ata gta ccc ctc att ctc gag tac aga aag atc cag aaa ctg His Glu Ile Val Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu 305 310 315 320	960
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gga aga att cat gca tct ttc cac cag acg ggt acc gcc act ggc agg Gly Arg Ile His Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg 340 345 350	1056
ttg agt agc agt gat cca aat ctt cag aat ctt ccg aca aag agc gaa Leu Ser Ser Ser Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu 355 360 365	1104
gag gga aaa gaa att aga aaa gcg att gtg ccc cag gat cca gac tgg Glu Gly Lys Glu Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp 370 375 380	1152
tgg atc gtc agt gcg gat tat tcc caa ata gaa ctc aga atc ctc gct Trp Ile Val Ser Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala 385 390 395 400	1200
cat ctc agt ggt gat gag aac ctt gtg aag gcc ttc gag gag ggc atc His Leu Ser Gly Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile 405 410 415	1248
gat gtg cac acc ttg act gcc tcc agg atc tac aac gta aag cca gaa Asp Val His Thr Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu 420 425 430	1296
gaa gtg aac gaa gaa atg cga cgg gtt gga aag atg gtg aac ttc tct Glu Val Asn Glu Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser 435 440 445	1344

ata ata tac ggt gtc aca ccg tac ggt ctt tct gtg aga ctt gga ata Ile Ile Tyr Gly Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile 450 455 460	1392
ccg gtt aaa gaa gca gaa aag atg att atc agc tat ttc aca ctg tat Pro Val Lys Glu Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr 465 470 475 480	1440
cca aag gtg cga agc tac atc cag cag gtt gtt gca gag gca aaa gag Pro Lys Val Arg Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu 485 490 495	1488
aag ggc tac gtc agg act ctc ttt gga aga aaa aga gat att ccc cag Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln 500 505 510	1536
ctc atg gca agg gac aag aac acc cag tcc gaa ggc gaa aga atc gca Leu Met Ala Arg Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala 515 520 525	1584
ata aac acc ccc att cag gga acg gcg gca gat ata ata aaa ttg gct Ile Asn Thr Pro Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala 530 535 540	1632
atg ata gat ata gac gag gag ctg aga aaa aga aac atg aaa tcc aga Met Ile Asp Ile Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg 545 550 555 560	1680
atg atc att cag gtt cat gac gaa ctg gtc ttc gag gtt ccc gat gag Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu 565 570 575	1728
gaa aaa gaa gaa cta gtt gat ctg gtg aag aac aaa atg aca aat gtg Glu Lys Glu Glu Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val 580 585 590	1776
gtg aaa ctc tct gtg cct ctt gag gtt gac ata agc atc gga aaa agc Val Lys Leu Ser Val Pro Leu Glu Val Asp Ile Ser Ile Gly Lys Ser 595 600 605	1824
tgg tct tga Trp Ser 610	1833
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20 25 30

Glu Val Pro Ser Phe Ala Leu Asp Leu Glu Thr Ser Ser Leu Asp Pro
35 40 45

Phe Asn Cys Glu Ile Val Gly Ile Ser Val Ser Phe Lys Pro Lys Thr
50 55 60

Ala Tyr Tyr Ile Pro Leu His His Arg Asn Ala Gln Asn Leu Asp Glu
65 70 75 80

Thr Leu Val Leu Ser Lys Leu Lys Glu Ile Leu Glu Asp Pro Ser Ser
85 90 95

Lys Ile Val Gly Gln Asn Leu Lys Tyr Asp Tyr Lys Val Leu Met Val
100 105 110

Lys Gly Ile Ser Pro Val Tyr Pro His Phe Asp Thr Met Ile Ala Ala
115 120 125

Tyr Leu Leu Glu Pro Asn Glu Lys Lys Phe Asn Leu Glu Asp Leu Ser
130 135 140

Leu Lys Phe Leu Gly Tyr Lys Met Thr Ser Tyr Gln Glu Leu Met Ser
145 150 155 160

Phe Ser Ser Pro Leu Phe Gly Phe Ser Phe Ala Asp Val Pro Val Asp
165 170 175

Lys Ala Ala Asn Tyr Ser Cys Glu Asn Ala Asp Ile Thr Tyr Arg Leu
180 185 190

Tyr Lys Ile Leu Ser Met Lys Leu His Glu Ala Glu Leu Glu Asn Val
195 200 205

Phe Tyr Arg Ile Glu Met Pro Leu Val Asn Val Leu Ala Arg Met Glu
210 215 220

Leu Asn Gly Val Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu
225 230 235 240

Glu Tyr Gly Lys Lys Leu Glu Glu Leu Ala Glu Lys Ile Tyr Gln Ile
 245 250 255

Ala Gly Glu Pro Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile
 260 265 270

Leu Phe Glu Lys Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr
 275 280 285

Gly Ala Tyr Ser Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu
 290 295 300

His Glu Ile Val Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu
 305 310 315 320

Lys Ser Thr Tyr Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr
 325 330 335

Gly Arg Ile His Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg
 340 345 350

Leu Ser Ser Ser Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu
 355 360 365

Glu Gly Lys Glu Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp
 370 375 380

Trp Ile Val Ser Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala
 385 390 395 400

His Leu Ser Gly Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile
 405 410 415

Asp Val His Thr Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu
 420 425 430

Glu Val Asn Glu Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser
 435 440 445

Ile Ile Tyr Gly Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile
 450 455 460

Pro Val Lys Glu Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr
 465 470 475 480

Pro Lys Val Arg Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu
 485 490 495

Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln
500 505 510

Leu Met Ala Arg Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala
515 520 525

Ile Asn Thr Pro Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala
530 535 540

Met Ile Asp Ile Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg
545 550 555 560

Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu
565 570 575

Glu Lys Glu Glu Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val
580 585 590

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595 600 605

Trp Ser
610

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atc gtg aag gat cat aag acc ttc gaa gat ctc atc gaa aag ctg aag	96
Ile Val Lys Asp His Lys Thr Phe Glu Asp Leu Ile Glu Lys Leu Lys	
20 25 30	
gag gtt cca tct ttt gcc ctg gcc ctt gaa acg tcc tcc ctt gac ccg	144
Glu Val Pro Ser Phe Ala Leu Ala Leu Glu Thr Ser Ser Leu Asp Pro	
35 40 45	
ttc aac tgt gag ata gtc ggc atc tcc gtg tcg ttc aaa ccg aaa aca	192
Phe Asn Cys Glu Ile Val Gly Ile Ser Val Ser Phe Lys Pro Lys Thr	
50 55 60	
gct tat tac att cca ctt cat cac aga aac gcc cag aat ctt gat gaa	240
Ala Tyr Tyr Ile Pro Leu His His Arg Asn Ala Gln Asn Leu Asp Glu	
65 70 75 80	
aca ctg gtg ctg tcg aag ttg aaa gag atc ctc gaa gac ccg tct tcg	288
Thr Leu Val Leu Ser Lys Leu Lys Glu Ile Leu Glu Asp Pro Ser Ser	
85 90 95	
aag att gtg ggt cag aac ctg aag tac gac tac aag gtt ctt atg gta	336
Lys Ile Val Gly Gln Asn Leu Lys Tyr Asp Tyr Lys Val Leu Met Val	
100 105 110	
aag ggt ata tcg cca gtt tat ccg cat ttt gac acg atg ata gct gca	384
Lys Gly Ile Ser Pro Val Tyr Pro His Phe Asp Thr Met Ile Ala Ala	
115 120 125	
tat ttg ctg gag cca aac gag aaa aaa ttc aat ctc gaa gat ctg tct	432
Tyr Leu Leu Glu Pro Asn Glu Lys Lys Phe Asn Leu Glu Asp Leu Ser	
130 135 140	
ttg aaa ttt ctc gga tac aaa atg acg tct tat cag gaa ctg atg tcg	480
Leu Lys Phe Leu Gly Tyr Lys Met Thr Ser Tyr Gln Glu Leu Met Ser	
145 150 155 160	
ttt tcc tca cca ctt ttt ggt ttc agc ttt gcg gat gtt ccg gta gac	528
Phe Ser Ser Pro Leu Phe Gly Phe Ser Phe Ala Asp Val Pro Val Asp	
165 170 175	
aag gct gcg aac tac tcc tgc gag gat gca gac atc act tat agg ctc	576
Lys Ala Ala Asn Tyr Ser Cys Glu Asp Ala Asp Ile Thr Tyr Arg Leu	
180 185 190	
tac aag ata ctc agc atg aag ctc cat gaa gcg gaa ctt gag aac gtc	624
Tyr Lys Ile Leu Ser Met Lys Leu His Glu Ala Glu Leu Glu Asn Val	
195 200 205	

ttc tac agg ata gag atg ccg ctt gtg aac gtt ctt gca cgc atg gaa Phe Tyr Arg Ile Glu Met Pro Leu Val Asn Val Leu Ala Arg Met Glu 210 215 220	672
ttg aac ggg gtg tat gtg gac aca gaa ttc ctg aaa aag ctc tcg gag Leu Asn Gly Val Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu 225 230 235 240	720
gag tac ggc aaa aag ctc gag gaa ctg gcc gaa aaa atc tac cag ata Glu Tyr Gly Lys Lys Leu Glu Glu Leu Ala Glu Lys Ile Tyr Gln Ile 245 250 255	768
gca gga gag ccc ttc aac atc aat tct cca aaa cag gtt tca aag atc Ala Gly Glu Pro Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile 260 265 270	816
ctt ttt gag aag ctg gga ata aaa ccc cgt gga aaa acg aca aaa aca Leu Phe Glu Lys Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr 275 280 285	864
gga gcg tac tct acc agg ata gag gtg ttg gaa gag ata gcg aat gag Gly Ala Tyr Ser Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu 290 295 300	912
cac gag ata gta ccc ctc att ctc gag tac aga aag atc cag aaa ctg His Glu Ile Val Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu 305 310 315 320	960
aaa tcg acc tac ata gac acc ctt ccg aaa ctt gtg aac ccg aaa acc Lys Ser Thr Tyr Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr 325 330 335	1008
gga aga att cat gca tct ttc cac cag acg ggt acc gcc act ggc agg Gly Arg Ile His Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg 340 345 350	1056
ttg agt agc agt gat cca aat ctt cag aat ctt ccg aca aag agc gaa Leu Ser Ser Ser Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu 355 360 365	1104
gag gga aaa gaa att aga aaa gcg att gtg ccc cag gat cca gac tgg Glu Gly Lys Glu Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp 370 375 380	1152
tgg atc gtc agt gcg gat tat tcc caa ata gaa ctc aga atc ctc gct Trp Ile Val Ser Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala 385 390 395 400	1200
cat ctc agt ggt gat gag aac ctt gtg aag gcc ttc gag gag ggc atc His Leu Ser Gly Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile 405 410 415	1248
gat gtg cac acc ttg act gcc tcc agg atc tac aac gta aag cca gaa Asp Val His Thr Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu 420 425 430	1296
gaa gtg aac gaa gaa atg cga cgg gtt gga aag atg gtg aac ttc tct Glu Val Asn Glu Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser 435 440 445	1344

ata ata tac ggt gtc aca ccg tac ggt ctt tct gtg aga ctt gga ata Ile Ile Tyr Gly Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile 450 455 460	1392
ccg gtt aaa gaa gca gaa aag atg att atc agc tat ttc aca ctg tat Pro Val Lys Glu Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr 465 470 475 480	1440
cca aag gtg cga agc tac atc cag cag gtt gtt gca gag gca aaa gag Pro Lys Val Arg Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu 485 490 495	1488
aag ggc tac gtc agg act ctc ttt gga aga aaa aga gat att ccc cag Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln 500 505 510	1536
ctc atg gca agg gac aag aac acc cag tcc gaa ggc gaa aga atc gca Leu Met Ala Arg Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala 515 520 525	1584
ata aac acc ccc att cag gga acg gcg gca gat ata ata aaa ttg gct Ile Asn Thr Pro Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala 530 535 540	1632
atg ata gat ata gac gag gag ctg aga aaa aga aac atg aaa tcc aga Met Ile Asp Ile Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg 545 550 555 560	1680
atg atc att cag gtt cat gac gaa ctg gtc ttc gag gtt ccc gat gag Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu 565 570 575	1728
gaa aaa gaa gaa cta gtt gat ctg gtg aag aac aaa atg aca aat gtg Glu Lys Glu Glu Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val 580 585 590	1776
gtg aaa ctc tct gtg cct ctt gag gtt gac ata agc atc gga aaa agc Val Lys Leu Ser Val Pro Leu Glu Val Asp Ile Ser Ile Gly Lys Ser 595 600 605	1824
tgg tct tga Trp Ser 610	1833
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Glu Val Pro Ser Phe Ala Leu Ala Leu Glu Thr Ser Ser Leu Asp Pro
35 40 45

Phe Asn Cys Glu Ile Val Gly Ile Ser Val Ser Phe Lys Pro Lys Thr
50 55 60

Ala Tyr Tyr Ile Pro Leu His His Arg Asn Ala Gln Asn Leu Asp Glu
65 70 75 80

Thr Leu Val Leu Ser Lys Leu Lys Glu Ile Leu Glu Asp Pro Ser Ser
85 90 95

Lys Ile Val Gly Gln Asn Leu Lys Tyr Asp Tyr Lys Val Leu Met Val
100 105 110

Lys Gly Ile Ser Pro Val Tyr Pro His Phe Asp Thr Met Ile Ala Ala
115 120 125

Tyr Leu Leu Glu Pro Asn Glu Lys Lys Phe Asn Leu Glu Asp Leu Ser
130 135 140

Leu Lys Phe Leu Gly Tyr Lys Met Thr Ser Tyr Gln Glu Leu Met Ser
145 150 155 160

Phe Ser Ser Pro Leu Phe Gly Phe Ser Phe Ala Asp Val Pro Val Asp
165 170 175

Lys Ala Ala Asn Tyr Ser Cys Glu Asp Ala Asp Ile Thr Tyr Arg Leu
180 185 190

Tyr Lys Ile Leu Ser Met Lys Leu His Glu Ala Glu Leu Glu Asn Val
195 200 205

Phe Tyr Arg Ile Glu Met Pro Leu Val Asn Val Leu Ala Arg Met Glu
210 215 220

Leu Asn Gly Val Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu
225 230 235 240

Glu Tyr Gly Lys Lys Leu Glu Glu Leu Ala Glu Lys Ile Tyr Gln Ile
 245 250 255
 Ala Gly Glu Pro Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile
 260 265 270
 Leu Phe Glu Lys Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr
 275 280 285
 Gly Ala Tyr Ser Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu
 290 295 300
 His Glu Ile Val Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu
 305 310 315 320
 Lys Ser Thr Tyr Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr
 325 330 335
 Gly Arg Ile His Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg
 340 345 350
 Leu Ser Ser Ser Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu
 355 360 365
 Glu Gly Lys Glu Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp
 370 375 380
 Trp Ile Val Ser Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala
 385 390 395 400
 His Leu Ser Gly Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile
 405 410 415
 Asp Val His Thr Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu
 420 425 430
 Glu Val Asn Glu Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser
 435 440 445
 Ile Ile Tyr Gly Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile
 450 455 460
 Pro Val Lys Glu Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr
 465 470 475 480
 Pro Lys Val Arg Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu
 485 490 495

Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln
500 505 510

Leu Met Ala Arg Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala
515 520 525

Ile Asn Thr Pro Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala
530 535 540

Met Ile Asp Ile Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg
545 550 555 560

Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu
565 570 575

Glu Lys Glu Glu Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val
580 585 590

Val Lys Leu Ser Val Pro Leu Glu Val Asp Ile Ser Ile Gly Lys Ser
595 600 605

Trp Ser
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Ile Val Lys Asp His Lys Thr Phe Glu Asp Leu Ile Glu Lys Leu Lys
20 25 30

gag gtt cca tct ttt gcc ctg gac ctt gaa acg tcc tcc ctt gac ccg 144
Glu Val Pro Ser Phe Ala Leu Asp Leu Glu Thr Ser Ser Leu Asp Pro
35 40 45

ttc aac tgt gag ata gtc ggc atc tcc gtg tcg ttc aaa ccg aaa aca 192
Phe Asn Cys Glu Ile Val Gly Ile Ser Val Ser Phe Lys Pro Lys Thr
50 55 60

gct tat tac att cca ctt cat cac aga aac gcc cag aat ctt gat gaa 240
Ala Tyr Tyr Ile Pro Leu His His Arg Asn Ala Gln Asn Leu Asp Glu
65 70 75 80

aca ctg gtg ctg tcg aag ttg aaa gag atc ctc gaa gac ccg tct tcg 288
Thr Leu Val Leu Ser Lys Leu Lys Glu Ile Leu Glu Asp Pro Ser Ser
85 90 95

aag att gtg ggt cag aac ctg aag tac gcg tac aag gtt ctt atg gta 336
Lys Ile Val Gly Gln Asn Leu Lys Tyr Ala Tyr Lys Val Leu Met Val
100 105 110

aag ggt ata tcg cca gtt tat ccg cat ttt gac acg atg ata gct gca 384
Lys Gly Ile Ser Pro Val Tyr Pro His Phe Asp Thr Met Ile Ala Ala
115 120 125

tat ttg ctg gag cca aac gag aaa aaa ttc aat ctc gaa gat ctg tct 432
Tyr Leu Leu Glu Pro Asn Glu Lys Lys Phe Asn Leu Glu Asp Leu Ser
130 135 140

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ttg aaa ttt ctc gga tac aaa atg acg tct tat cag gaa ctg atg tcg Leu Lys Phe Leu Gly Tyr Lys Met Thr Ser Tyr Gln Glu Leu Met Ser 145 150 155 160	480
ttt tcc tca cca ctt ttt ggt ttc agc ttt gcg gat gtt ccg gta gac Phe Ser Ser Pro Leu Phe Gly Phe Ser Phe Ala Asp Val Pro Val Asp 165 170 175	528
aag gct gcg aac tac tcc tgc gag gat gca gac atc act tat agg ctc Lys Ala Ala Asn Tyr Ser Cys Glu Asp Ala Asp Ile Thr Tyr Arg Leu 180 185 190	576
tac aag ata ctc agc atg aag ctc cat gaa gcg gaa ctt gag aac gtc Tyr Lys Ile Leu Ser Met Lys Leu His Glu Ala Glu Leu Glu Asn Val 195 200 205	624
ttc tac agg ata gag atg ccg ctt gtg aac gtt ctt gca cgc atg gaa Phe Tyr Arg Ile Glu Met Pro Leu Val Asn Val Leu Ala Arg Met Glu 210 215 220	672
ttg aac ggg gtg tat gtg gac aca gaa ttc ctg aaa aag ctc tcg gag Leu Asn Gly Val Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu 225 230 235 240	720
gag tac ggc aaa aag ctc gag gaa ctg gcc gaa aaa atc tac cag ata Glu Tyr Gly Lys Lys Leu Glu Glu Leu Ala Glu Lys Ile Tyr Gln Ile 245 250 255	768
gca gga gag ccc ttc aac atc aat tct cca aaa cag gtt tca aag atc Ala Gly Glu Pro Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile 260 265 270	816
ctt ttt gag aag ctg gga ata aaa ccc cgt gga aaa acg aca aaa aca Leu Phe Glu Lys Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr 275 280 285	864
gga gcg tac tct acc agg ata gag gtg ttg gaa gag ata gcg aat gag Gly Ala Tyr Ser Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu 290 295 300	912
cac gag ata gta ccc ctc att ctc gag tac aga aag atc cag aaa ctg His Glu Ile Val Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu 305 310 315 320	960
aaa tcg acc tac ata gac acc ctt ccg aaa ctt gtg aac ccg aaa acc Lys Ser Thr Tyr Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr 325 330 335	1008
gga aga att cat gca tct ttc cac cag acg ggt acc gcc act ggc agg Gly Arg Ile His Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg 340 345 350	1056
ttg agt agc agt gat cca aat ctt cag aat ctt ccg aca aag agc gaa Leu Ser Ser Ser Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu 355 360 365	1104
gag gga aaa gaa att aga aaa gcg att gtg ccc cag gat cca gac tgg Glu Gly Lys Glu Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp 370 375 380	1152

tgg atc gtc agt gcg gat tat tcc caa ata gaa ctc aga atc ctc gct Trp Ile Val Ser Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala 385 390 395 400	1200
cat ctc agt ggt gat gag aac ctt gtg aag gcc ttc gag gag ggc atc His Leu Ser Gly Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile 405 410 415	1248
gat gtg cac acc ttg act gcc tcc agg atc tac aac gta aag cca gaa Asp Val His Thr Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu 420 425 430	1296
gaa gtg aac gaa gaa atg cga cgg gtt gga aag atg gtg aac ttc tct Glu Val Asn Glu Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser 435 440 445	1344
ata ata tac ggt gtc aca ccg tac ggt ctt tct gtg aga ctt gga ata Ile Ile Tyr Gly Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile 450 455 460	1392
ccg gtt aaa gaa gca gaa aag atg att atc agc tat ttc aca ctg tat Pro Val Lys Glu Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr 465 470 475 480	1440
cca aag gtg cga agc tac atc cag cag gtt gtt gca gag gca aaa gag Pro Lys Val Arg Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu 485 490 495	1488
aag ggc tac gtc agg act ctc ttt gga aga aaa aga gat att ccc cag Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln 500 505 510	1536
ctc atg gca agg gac aag aac acc cag tcc gaa ggc gaa aga atc gca Leu Met Ala Arg Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala 515 520 525	1584
ata aac acc ccc att cag gga acg gcg gca gat ata ata aaa ttg gct Ile Asn Thr Pro Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala 530 535 540	1632
atg ata gat ata gac gag gag ctg aga aaa aga aac atg aaa tcc aga Met Ile Asp Ile Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg 545 550 555 560	1680
atg atc att cag gtt cat gac gaa ctg gtc ttc gag gtt ccc gat gag Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu 565 570 575	1728
gaa aaa gaa gaa cta gtt gat ctg gtg aag aac aaa atg aca aat gtg Glu Lys Glu Glu Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val 580 585 590	1776
gtg aaa ctc tct gtg cct ctt gag gtt gac ata agc atc gga aaa agc Val Lys Leu Ser Val Pro Leu Glu Val Asp Ile Ser Ile Gly Lys Ser 595 600 605	1824
tgg tct tga Trp Ser 610	1833

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<211> 610

<212> PRT

<213> Artificial/Unknown

<220>

<221> misc_feature

<223> Synthetic

<400> 33

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Ile Val Lys Asp His Lys Thr Phe Glu Asp Leu Ile Glu Lys Leu Lys
20 25 30

Glu Val Pro Ser Phe Ala Leu Asp Leu Glu Thr Ser Ser Leu Asp Pro
35 40 45

Phe Asn Cys Glu Ile Val Gly Ile Ser Val Ser Phe Lys Pro Lys Thr
50 55 60

Ala Tyr Tyr Ile Pro Leu His His Arg Asn Ala Gln Asn Leu Asp Glu
65 70 75 80

Thr Leu Val Leu Ser Lys Leu Lys Glu Ile Leu Glu Asp Pro Ser Ser
85 90 95

Lys Ile Val Gly Gln Asn Leu Lys Tyr Ala Tyr Lys Val Leu Met Val
100 105 110

Lys Gly Ile Ser Pro Val Tyr Pro His Phe Asp Thr Met Ile Ala Ala
115 120 125

Tyr Leu Leu Glu Pro Asn Glu Lys Lys Phe Asn Leu Glu Asp Leu Ser
130 135 140

Leu Lys Phe Leu Gly Tyr Lys Met Thr Ser Tyr Gln Glu Leu Met Ser
145 150 155 160

Phe Ser Ser Pro Leu Phe Gly Phe Ser Phe Ala Asp Val Pro Val Asp
165 170 175

Lys Ala Ala Asn Tyr Ser Cys Glu Asp Ala Asp Ile Thr Tyr Arg Leu
180 185 190

Tyr Lys Ile Leu Ser Met Lys Leu His Glu Ala Glu Leu Glu Asn Val
 195 200 205

Phe Tyr Arg Ile Glu Met Pro Leu Val Asn Val Leu Ala Arg Met Glu
 210 215 220

Leu Asn Gly Val Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu
 225 230 235 240

Glu Tyr Gly Lys Lys Leu Glu Glu Leu Ala Glu Lys Ile Tyr Gln Ile
 245 250 255

Ala Gly Glu Pro Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile
 260 265 270

Leu Phe Glu Lys Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr
 275 280 285

Gly Ala Tyr Ser Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu
 290 295 300

His Glu Ile Val Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu
 305 310 315 320

Lys Ser Thr Tyr Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr
 325 330 335

Gly Arg Ile His Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg
 340 345 350

Leu Ser Ser Ser Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu
 355 360 365

Glu Gly Lys Glu Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp
 370 375 380

Trp Ile Val Ser Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala
 385 390 395 400

His Leu Ser Gly Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile
 405 410 415

Asp Val His Thr Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu
 420 425 430

Glu Val Asn Glu Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser
435 440 445

Ile Ile Tyr Gly Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile
450 455 460

Pro Val Lys Glu Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr
465 470 475 480

Pro Lys Val Arg Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu
485 490 495

Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln
500 505 510

Leu Met Ala Arg Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala
515 520 525

Ile Asn Thr Pro Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala
530 535 540

Met Ile Asp Ile Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg
545 550 555 560

Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu
565 570 575

Glu Lys Glu Glu Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val
580 585 590

Val Lys Leu Ser Val Pro Leu Glu Val Asp Ile Ser Ile Gly Lys Ser
595 600 605

Trp Ser
610

<210> 34

<211> 1833

<212> DNA

<213> Artificial/Unknown

<220>

<221> misc_feature

<223> Synthetic

<220>

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<222> (1)..(1830)

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Met Lys Glu Leu Gln Leu Tyr Glu Glu Ala Glu Pro Thr Gly Tyr Glu	
1 5 10 15	

atc gtg aag gat cat aag acc ttc gaa gat ctc atc gaa aag ctg aag	96
Ile Val Lys Asp His Lys Thr Phe Glu Asp Leu Ile Glu Lys Leu Lys	
20 25 30	

gag gtt cca tct ttt gcc ctg gcc ctt gaa acg tcc tcc ctt gac ccg	144
Glu Val Pro Ser Phe Ala Leu Glu Leu Glu Thr Ser Ser Leu Asp Pro	
35 40 45	

ttc aac tgt gag ata gtc ggc atc tcc gtg tcg ttc aaa ccg aaa aca	192
Phe Asn Cys Glu Ile Val Gly Ile Ser Val Ser Phe Lys Pro Lys Thr	
50 55 60	

gct tat tac att cca ctt cat cac aga aac gcc cag aat ctt gat gaa	240
Ala Tyr Tyr Ile Pro Leu His His Arg Asn Ala Gln Asn Leu Asp Glu	
65 70 75 80	

aca ctg gtg ctg tcg aag ttg aaa gag atc ctc gaa gac ccg tct tcg	288
Thr Leu Val Leu Ser Lys Leu Lys Glu Ile Leu Glu Asp Pro Ser Ser	
85 90 95	

aag att gtg ggt cag aac ctg aag tac gcg tac aag gtt ctt atg gta	336
Lys Ile Val Gly Gln Asn Leu Lys Tyr Ala Tyr Lys Val Leu Met Val	
100 105 110	

aag ggt ata tcg cca gtt tat ccg cat ttt gac acg atg ata gct gca	384
Lys Gly Ile Ser Pro Val Tyr Pro His Phe Asp Thr Met Ile Ala Ala	
115 120 125	

tat ttg ctg gag cca aac gag aaa aaa ttc aat ctc gaa gat ctg tct	432
Tyr Leu Leu Glu Pro Asn Glu Lys Lys Phe Asn Leu Glu Asp Leu Ser	
130 135 140	

ttg aaa ttt ctc gga tac aaa atg acg tct tat cag gaa ctg atg tcg	480
Leu Lys Phe Leu Gly Tyr Lys Met Thr Ser Tyr Gln Glu Leu Met Ser	
145 150 155 160	

ttt tcc tca cca ctt ttt ggt ttc agc ttt gcg gat gtt ccg gta gac	528
Phe Ser Ser Pro Leu Phe Gly Phe Ser Phe Ala Asp Val Pro Val Asp	
165 170 175	

aag gct gcg aac tac tcc tgc gag gat gca gac atc act tat agg ctc	576
Lys Ala Ala Asn Tyr Ser Cys Glu Asp Ala Asp Ile Thr Tyr Arg Leu	
180 185 190	

tac aag ata ctc agc atg aag ctc cat gaa gcg gaa ctt gag aac gtc	624
Tyr Lys Ile Leu Ser Met Lys Leu His Glu Ala Glu Leu Glu Asn Val	
195 200 205	

ttc tac agg ata gag atg ccg ctt gtg aac gtt ctt gca cgc atg gaa	672
Phe Tyr Arg Ile Glu Met Pro Leu Val Asn Val Leu Ala Arg Met Glu	
210 215 220	

ttg aac ggg gtg tat gtg gac aca gaa ttc ctg aaa aag ctc tcg gag Leu Asn Gly Val Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu 225 230 235 240	720
gag tac ggc aaa aag ctc gag gaa ctg gcc gaa aaa atc tac cag ata Glu Tyr Gly Lys Lys Leu Glu Glu Leu Ala Glu Lys Ile Tyr Gln Ile 245 250 255	768
gca gga gag ccc ttc aac atc aat tct cca aaa cag gtt tca aag atc Ala Gly Glu Pro Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile 260 265 270	816
ctt ttt gag aag ctg gga ata aaa ccc cgt gga aaa acg aca aaa aca Leu Phe Glu Lys Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr 275 280 285	864
gga gcg tac tct acc agg ata gag gtg ttg gaa gag ata gcg aat gag Gly Ala Tyr Ser Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu 290 295 300	912
cac gag ata gta ccc ctc att ctc gag tac aga aag atc cag aaa ctg His Glu Ile Val Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu 305 310 315 320	960
aaa tcg acc tac ata gac acc ctt ccg aaa ctt gtg aac ccg aaa acc Lys Ser Thr Tyr Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr 325 330 335	1008
gga aga att cat gca tct ttc cac cag acg ggt acc gcc act ggc agg Gly Arg Ile His Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg 340 345 350	1056
ttg agt agc agt gat cca aat ctt cag aat ctt ccg aca aag agc gaa Leu Ser Ser Ser Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu 355 360 365	1104
gag gga aaa gaa att aga aaa gcg att gtg ccc cag gat cca gac tgg Glu Gly Lys Glu Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp 370 375 380	1152
tgg atc gtc agt gcg gat tat tcc caa ata gaa ctc aga atc ctc gct Trp Ile Val Ser Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala 385 390 395 400	1200
cat ctc agt ggt gat gag aac ctt gtg aag gcc ttc gag gag ggc atc His Leu Ser Gly Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile 405 410 415	1248
gat gtg cac acc ttg act gcc tcc agg atc tac aac gta aag cca gaa Asp Val His Thr Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu 420 425 430	1296
gaa gtg aac gaa gaa atg cga cgg gtt gga aag atg gtg aac ttc tct Glu Val Asn Glu Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser 435 440 445	1344
ata ata tac ggt gtc aca ccg tac ggt ctt tct gtg aga ctt gga ata Ile Ile Tyr Gly Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile 450 455 460	1392

ccg gtt aaa gaa gca gaa aag atg att atc agc tat ttc aca ctg tat	1440
Pro Val Lys Glu Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr	
465 470 475 480	
cca aag gtg cga agc tac atc cag cag gtt gtt gca gag gca aaa gag	1488
Pro Lys Val Arg Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu	
485 490 495	
aag ggc tac gtc agg act ctc ttt gga aga aaa aga gat att ccc cag	1536
Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln	
500 505 510	
ctc atg gca agg gac aag aac acc cag tcc gaa ggc gaa aga atc gca	1584
Leu Met Ala Arg Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala	
515 520 525	
ata aac acc ccc att cag gga acg gcg gca gat ata ata aaa ttg gct	1632
Ile Asn Thr Pro Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala	
530 535 540	
atg ata gat ata gac gag gag ctg aga aaa aga aac atg aaa tcc aga	1680
Met Ile Asp Ile Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg	
545 550 555 560	
atg atc att cag gtt cat gac gaa ctg gtc ttc gag gtt ccc gat gag	1728
Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu	
565 570 575	
gaa aaa gaa gaa cta gtt gat ctg gtg aag aac aaa atg aca aat gtg	1776
Glu Lys Glu Glu Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val	
580 585 590	
gtg aaa ctc tct gtg cct ctt gag gtt gac ata agc atc gga aaa agc	1824
Val Lys Leu Ser Val Pro Leu Glu Val Asp Ile Ser Ile Gly Lys Ser	
595 600 605	
tgg tct tga	1833
Trp Ser	
610	

<210> 35

<211> 610

<212> PRT

<213> Artificial/Unknown

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<223> Synthetic

<400> 35

Met Lys Glu Leu Gln Leu Tyr Glu Glu Ala Glu Pro Thr Gly Tyr Glu
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Ile Val Lys Asp His Lys Thr Phe Glu Asp Leu Ile Glu Lys Leu Lys
20 25 30

Glu Val Pro Ser Phe Ala Leu Ala Leu Glu Thr Ser Ser Leu Asp Pro
 35 40 45

Phe Asn Cys Glu Ile Val Gly Ile Ser Val Ser Phe Lys Pro Lys Thr
 50 55 60

Ala Tyr Tyr Ile Pro Leu His His Arg Asn Ala Gln Asn Leu Asp Glu
 65 70 75 80

Thr Leu Val Leu Ser Lys Leu Lys Glu Ile Leu Glu Asp Pro Ser Ser
 85 90 95

Lys Ile Val Gly Gln Asn Leu Lys Tyr Ala Tyr Lys Val Leu Met Val
 100 105 110

Lys Gly Ile Ser Pro Val Tyr Pro His Phe Asp Thr Met Ile Ala Ala
 115 120 125

Tyr Leu Leu Glu Pro Asn Glu Lys Lys Phe Asn Leu Glu Asp Leu Ser
 130 135 140

Leu Lys Phe Leu Gly Tyr Lys Met Thr Ser Tyr Gln Glu Leu Met Ser
 145 150 155 160

Phe Ser Ser Pro Leu Phe Gly Phe Ser Phe Ala Asp Val Pro Val Asp
 165 170 175

Lys Ala Ala Asn Tyr Ser Cys Glu Asp Ala Asp Ile Thr Tyr Arg Leu
 180 185 190

Tyr Lys Ile Leu Ser Met Lys Leu His Glu Ala Glu Leu Glu Asn Val
 195 200 205

Phe Tyr Arg Ile Glu Met Pro Leu Val Asn Val Leu Ala Arg Met Glu
 210 215 220

Leu Asn Gly Val Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu
 225 230 235 240

Glu Tyr Gly Lys Lys Leu Glu Glu Leu Ala Glu Lys Ile Tyr Gln Ile
 245 250 255

Ala Gly Glu Pro Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile
 260 265 270

Leu Phe Glu Lys Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr
 275 280 285

Gly Ala Tyr Ser Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu
 290 295 300

His Glu Ile Val Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu
 305 310 315 320

Lys Ser Thr Tyr Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr
 325 330 335

Gly Arg Ile His Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg
 340 345 350

Leu Ser Ser Ser Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu
 355 360 365

Glu Gly Lys Glu Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp
 370 375 380

Trp Ile Val Ser Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala
 385 390 395 400

His Leu Ser Gly Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile
 405 410 415

Asp Val His Thr Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu
 420 425 430

Glu Val Asn Glu Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser
 435 440 445

Ile Ile Tyr Gly Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile
 450 455 460

Pro Val Lys Glu Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr
 465 470 475 480

Pro Lys Val Arg Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu
 485 490 495

Lys Gly Tyr Val Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln
 500 505 510

Leu Met Ala Arg Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala
 515 520 525

Ile Asn Thr Pro Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala
 530 535 540

Met Ile Asp Ile Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg
 545 550 555 560

Met Ile Ile Gln Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu
 565 570 575

Glu Lys Glu Glu Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val
 580 585 590

Val Lys Leu Ser Val Pro Leu Glu Val Asp Ile Ser Ile Gly Lys Ser
 595 600 605

Trp Ser
 610

<210> 36

<211> 1716

<212> DNA

<213> Artificial/Unknown

<220>

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<223> Synthetic

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<222> (1)..(1713)

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1 5 10 15	
atc tcc gtg tcg ttc aaa ccg aaa aca gct tat tac att cca ctt cat	96
Ile Ser Val Ser Phe Lys Pro Lys Thr Ala Tyr Tyr Ile Pro Leu His	
20 25 30	
cac aga aac gcc cag aat ctt gat gaa aca ctg gtg ctg tcg aag ttg	144
His Arg Asn Ala Gln Asn Leu Asp Glu Thr Leu Val Leu Ser Lys Leu	
35 40 45	
aaa gag atc ctc gaa gac ccg tct tcg aag att gtg ggt cag aac ctg	192
Lys Glu Ile Leu Glu Asp Pro Ser Ser Lys Ile Val Gly Gln Asn Leu	
50 55 60	

aag tac gac tac aag gtt ctt atg gta aag ggt ata tcg cca gtt tat	240
Lys Tyr Asp Tyr Lys Val Leu Met Val Lys Gly Ile Ser Pro Val Tyr	
65 70 75 80	
ccg cat ttt gac acg atg ata gct gca tat ttg ctg gag cca aac gag	288
Pro His Phe Asp Thr Met Ile Ala Ala Tyr Leu Leu Glu Pro Asn Glu	
85 90 95	
aaa aaa ttc aat ctc gaa gat ctg tct ttg aaa ttt ctc gga tac aaa	336
Lys Lys Phe Asn Leu Glu Asp Leu Ser Leu Lys Phe Leu Gly Tyr Lys	
100 105 110	
atg acg tct tat cag gaa ctg atg tcg ttt tcc tca cca ctt ttt ggt	384
Met Thr Ser Tyr Gln Glu Leu Met Ser Phe Ser Ser Pro Leu Phe Gly	
115 120 125	
ttc agc ttt gcg gat gtt ccg gta gac aag gct gcg aac tac tcc tgc	432
Phe Ser Phe Ala Asp Val Pro Val Asp Lys Ala Ala Asn Tyr Ser Cys	
130 135 140	
gag gat gca gac atc act tat agg ctc tac aag ata ctc agc atg aag	480
Glu Asp Ala Asp Ile Thr Tyr Arg Leu Tyr Lys Ile Leu Ser Met Lys	
145 150 155 160	
ctc cat gaa gcg gaa ctt gag aac gtc ttc tac agg ata gag atg ccg	528
Leu His Glu Ala Glu Leu Glu Asn Val Phe Tyr Arg Ile Glu Met Pro	
165 170 175	
ctt gtg aac gtt ctt gca cgc atg gaa ttg aac ggg gtg tat gtg gac	576
Leu Val Asn Val Leu Ala Arg Met Glu Leu Asn Gly Val Tyr Val Asp	
180 185 190	
aca gaa ttc ctg aaa aag ctc tcg gag gag tac ggc aaa aag ctc gag	624
Thr Glu Phe Leu Lys Lys Leu Ser Glu Glu Tyr Gly Lys Lys Leu Glu	
195 200 205	
gaa ctg gcc gaa aaa atc tac cag ata gca gga gag ccc ttc aac atc	672
Glu Leu Ala Glu Lys Ile Tyr Gln Ile Ala Gly Glu Pro Phe Asn Ile	
210 215 220	
aat tct cca aaa cag gtt tca aag atc ctt ttt gag aag ctg gga ata	720
Asn Ser Pro Lys Gln Val Ser Lys Ile Leu Phe Glu Lys Leu Gly Ile	
225 230 235 240	
aaa ccc cgt gga aaa acg aca aaa aca gga gcg tac tct acc agg ata	768
Lys Pro Arg Gly Lys Thr Thr Lys Thr Gly Ala Tyr Ser Thr Arg Ile	
245 250 255	
gag gtg ttg gaa gag ata gcg aat gag cac gag ata gta ccc ctc att	816
Glu Val Leu Glu Glu Ile Ala Asn Glu His Glu Ile Val Pro Leu Ile	
260 265 270	
ctc gag tac aga aag atc cag aaa ctg aaa tcg acc tac ata gac acc	864
Leu Glu Tyr Arg Lys Ile Gln Lys Leu Lys Ser Thr Tyr Ile Asp Thr	
275 280 285	
ctt ccg aaa ctt gtg aac ccg aaa acc gga aga att cat gca tct ttc	912
Leu Pro Lys Leu Val Asn Pro Lys Thr Gly Arg Ile His Ala Ser Phe	
290 295 300	

cac His 305	cag Gln	acg Thr	ggg Gly	acc Thr	gcc Ala 310	act Thr	ggc Gly	agg Arg	ttg Leu	agt Ser 315	agc Ser	agt Ser	gat Asp	cca Pro	aat Asn 320	960
ctt Leu	cag Gln	aat Asn	ctt Leu	ccg Pro 325	aca Thr	aag Lys	agc Ser	gaa Glu	gag Glu 330	gga Gly	aaa Lys	gaa Glu	att Ile	aga Arg 335	aaa Lys	1008
gcg Ala	att Ile	gtg Val	ccc Pro 340	cag Gln	gat Asp	cca Pro	gac Asp	tgg Trp 345	tgg Trp	atc Ile	gtc Val	agt Ser	gcg Ala 350	gat Asp	tat Tyr	1056
tcc Ser	caa Gln	ata Ile 355	gaa Glu	ctc Leu	aga Arg	atc Ile	ctc Leu 360	gct Ala	cat His	ctc Leu	agt Ser	ggg Gly 365	gat Asp	gag Glu	aac Asn	1104
ctt Leu	gtg Val 370	aag Lys	gcc Ala	ttc Phe	gag Glu	gag Glu 375	ggc Gly	atc Ile	gat Asp	gtg Val	cac His 380	acc Thr	ttg Leu	act Thr	gcc Ala	1152
tcc Ser 385	agg Arg	atc Ile	tac Tyr	aac Asn	gta Val 390	aag Lys	cca Pro	gaa Glu	gaa Glu 395	gtg Val	aac Asn	gaa Glu	gaa Glu	atg Met	cga Arg 400	1200
cgg Arg	gtt Val	gga Gly	aag Lys	atg Met 405	gtg Val	aac Asn	ttc Phe	tct Ser	ata Ile 410	ata Ile	tac Tyr	ggg Gly	gtc Val	aca Thr 415	ccg Pro	1248
tac Tyr	ggg Gly	ctt Leu	tct Ser 420	gtg Val	aga Arg	ctt Leu	gga Gly	ata Ile 425	ccg Pro	gtt Val	aaa Lys	gaa Glu	gca Ala 430	gaa Glu	aag Lys	1296
atg Met	att Ile	atc Ile	agc Ser	tat Tyr	ttc Phe	aca Thr	ctg Leu 440	tat Tyr	cca Pro	aag Lys	gtg Val	cga Arg 445	agc Ser	tac Tyr	atc Ile	1344
cag Gln 450	cag Gln	gtt Val	gtt Val	gca Ala	gag Glu	gca Ala 455	aaa Lys	gag Glu	aag Lys	ggc Gly	tac Tyr 460	gtc Val	agg Arg	act Thr	ctc Leu	1392
ttt Phe 465	gga Gly	aga Arg	aaa Lys	aga Arg	gat Asp 470	att Ile	ccc Pro	cag Gln	ctc Leu	atg Met 475	gca Ala	agg Arg	gac Asp	aag Lys	aac Asn 480	1440
acc Thr	cag Gln	tcc Ser	gaa Glu	ggc Gly 485	gaa Glu	aga Arg	atc Ile	gca Ala 490	ata Ile	aac Asn	acc Thr	ccc Pro	att Ile	cag Gln 495	gga Gly	1488
acg Thr	gcg Ala	gca Ala	gat Asp 500	ata Ile	ata Ile	aaa Lys	ttg Leu	gct Ala 505	atg Met	ata Ile	gat Asp	ata Ile	gac Asp 510	gag Glu	gag Glu	1536
ctg Leu	aga Arg	aaa Lys 515	aga Arg	aac Asn	atg Met	aaa Lys	tcc Ser 520	aga Arg	atg Met	atc Ile	att Ile	cag Gln 525	gtt Val	cat His	gac Asp	1584
gaa Glu 530	ctg Leu	gtc Val	ttc Phe	gag Glu	gtt Val	ccc Pro 535	gat Asp	gag Glu	gaa Glu	aaa Lys	gaa Glu 540	gaa Glu	cta Leu	gtt Val	gat Asp	1632

ctg gtg aag aac aaa atg aca aat gtg gtg aaa ctc tct gtg cct ctt 1680
 Leu Val Lys Asn Lys Met Thr Asn Val Val Lys Leu Ser Val Pro Leu
 545 550 555 560

gag gtt gac ata agc atc gga aaa agc tgg tct tga 1716
 Glu Val Asp Ile Ser Ile Gly Lys Ser Trp Ser
 565 570

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<211> 571

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<213> Artificial/Unknown

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<223> Synthetic

<400> 37

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Ile Ser Val Ser Phe Lys Pro Lys Thr Ala Tyr Tyr Ile Pro Leu His
 20 25 30

His Arg Asn Ala Gln Asn Leu Asp Glu Thr Leu Val Leu Ser Lys Leu
 35 40 45

Lys Glu Ile Leu Glu Asp Pro Ser Ser Lys Ile Val Gly Gln Asn Leu
 50 55 60

Lys Tyr Asp Tyr Lys Val Leu Met Val Lys Gly Ile Ser Pro Val Tyr
 65 70 75 80

Pro His Phe Asp Thr Met Ile Ala Ala Tyr Leu Leu Glu Pro Asn Glu
 85 90 95

Lys Lys Phe Asn Leu Glu Asp Leu Ser Leu Lys Phe Leu Gly Tyr Lys
 100 105 110

Met Thr Ser Tyr Gln Glu Leu Met Ser Phe Ser Ser Pro Leu Phe Gly
 115 120 125

Phe Ser Phe Ala Asp Val Pro Val Asp Lys Ala Ala Asn Tyr Ser Cys
 130 135 140

Glu Asp Ala Asp Ile Thr Tyr Arg Leu Tyr Lys Ile Leu Ser Met Lys
 145 150 155 160

Leu His Glu Ala Glu Leu Glu Asn Val Phe Tyr Arg Ile Glu Met Pro
165 170 175

Leu Val Asn Val Leu Ala Arg Met Glu Leu Asn Gly Val Tyr Val Asp
180 185 190

Thr Glu Phe Leu Lys Lys Leu Ser Glu Glu Tyr Gly Lys Lys Leu Glu
195 200 205

Glu Leu Ala Glu Lys Ile Tyr Gln Ile Ala Gly Glu Pro Phe Asn Ile
210 215 220

Asn Ser Pro Lys Gln Val Ser Lys Ile Leu Phe Glu Lys Leu Gly Ile
225 230 235 240

Lys Pro Arg Gly Lys Thr Thr Lys Thr Gly Ala Tyr Ser Thr Arg Ile
245 250 255

Glu Val Leu Glu Glu Ile Ala Asn Glu His Glu Ile Val Pro Leu Ile
260 265 270

Leu Glu Tyr Arg Lys Ile Gln Lys Leu Lys Ser Thr Tyr Ile Asp Thr
275 280 285

Leu Pro Lys Leu Val Asn Pro Lys Thr Gly Arg Ile His Ala Ser Phe
290 295 300

His Gln Thr Gly Thr Ala Thr Gly Arg Leu Ser Ser Ser Asp Pro Asn
305 310 315 320

Leu Gln Asn Leu Pro Thr Lys Ser Glu Glu Gly Lys Glu Ile Arg Lys
325 330 335

Ala Ile Val Pro Gln Asp Pro Asp Trp Trp Ile Val Ser Ala Asp Tyr
340 345 350

Ser Gln Ile Glu Leu Arg Ile Leu Ala His Leu Ser Gly Asp Glu Asn
355 360 365

Leu Val Lys Ala Phe Glu Glu Gly Ile Asp Val His Thr Leu Thr Ala
370 375 380

Ser Arg Ile Tyr Asn Val Lys Pro Glu Glu Val Asn Glu Glu Met Arg
385 390 395 400

Arg Val Gly Lys Met Val Asn Phe Ser Ile Ile Tyr Gly Val Thr Pro
405 410 415

Tyr Gly Leu Ser Val Arg Leu Gly Ile Pro Val Lys Glu Ala Glu Lys
420 425 430

Met Ile Ile Ser Tyr Phe Thr Leu Tyr Pro Lys Val Arg Ser Tyr Ile
435 440 445

Gln Gln Val Val Ala Glu Ala Lys Glu Lys Gly Tyr Val Arg Thr Leu
450 455 460

Phe Gly Arg Lys Arg Asp Ile Pro Gln Leu Met Ala Arg Asp Lys Asn
465 470 475 480

Thr Gln Ser Glu Gly Glu Arg Ile Ala Ile Asn Thr Pro Ile Gln Gly
485 490 495

Thr Ala Ala Asp Ile Ile Lys Leu Ala Met Ile Asp Ile Asp Glu Glu
500 505 510

Leu Arg Lys Arg Asn Met Lys Ser Arg Met Ile Ile Gln Val His Asp
515 520 525

Glu Leu Val Phe Glu Val Pro Asp Glu Glu Lys Glu Glu Leu Val Asp
530 535 540

Leu Val Lys Asn Lys Met Thr Asn Val Val Lys Leu Ser Val Pro Leu
545 550 555 560

Glu Val Asp Ile Ser Ile Gly Lys Ser Trp Ser
565 570

<210> 38

<211> 1485

<212> DNA

<213> Artificial/Unknown

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<223> Synthetic

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1 5 10 15	
atc gtg aag gat cat aag acc ttc gaa gat ctg tct ttg aaa ttt ctc	96
Ile Val Lys Asp His Lys Thr Phe Glu Asp Leu Ser Leu Lys Phe Leu	
20 25 30	
gga tac aaa atg acg tct tat cag gaa ctg atg tcg ttt tcc tca cca	144
Gly Tyr Lys Met Thr Ser Tyr Gln Glu Leu Met Ser Phe Ser Ser Pro	
35 40 45	
ctt ttt ggt ttc agc ttt gcg gat gtt ccg gta gac aag gct gcg aac	192
Leu Phe Gly Phe Ser Phe Ala Asp Val Pro Val Asp Lys Ala Ala Asn	
50 55 60	
tac tcc tgc gag gat gca gac atc act tat agg ctc tac aag ata ctc	240
Tyr Ser Cys Glu Asp Ala Asp Ile Thr Tyr Arg Leu Tyr Lys Ile Leu	
65 70 75 80	
agc atg aag ctc cat gaa gcg gaa ctt gag aac gtc ttc tac agg ata	288
Ser Met Lys Leu His Glu Ala Glu Leu Glu Asn Val Phe Tyr Arg Ile	
85 90 95	
gag atg ccg ctt gtg aac gtt ctt gca cgc atg gaa ttg aac ggg gtg	336
Glu Met Pro Leu Val Asn Val Leu Ala Arg Met Glu Leu Asn Gly Val	
100 105 110	
tat gtg gac aca gaa ttc ctg aaa aag ctc tcg gag gag tac ggc aaa	384
Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu Glu Tyr Gly Lys	
115 120 125	
aag ctc gag gaa ctg gcc gaa aaa atc tac cag ata gca gga gag ccc	432
Lys Leu Glu Glu Leu Ala Glu Lys Ile Tyr Gln Ile Ala Gly Glu Pro	
130 135 140	
ttc aac atc aat tct cca aaa cag gtt tca aag atc ctt ttt gag aag	480
Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile Leu Phe Glu Lys	
145 150 155 160	
ctg gga ata aaa ccc cgt gga aaa acg aca aaa aca gga gcg tac tct	528
Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr Gly Ala Tyr Ser	
165 170 175	
acc agg ata gag gtg ttg gaa gag ata gcg aat gag cac gag ata gta	576
Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu His Glu Ile Val	
180 185 190	
ccc ctc att ctc gag tac aga aag atc cag aaa ctg aaa tcg acc tac	624
Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu Lys Ser Thr Tyr	
195 200 205	
ata gac acc ctt ccg aaa ctt gtg aac ccg aaa acc gga aga att cat	672
Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr Gly Arg Ile His	
210 215 220	

gca tct ttc cac cag acg ggt acc gcc act ggc agg ttg agt agc agt Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg Leu Ser Ser Ser 225 230 235 240	720
gat cca aat ctt cag aat ctt ccg aca aag agc gaa gag gga aaa gaa Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu Glu Gly Lys Glu 245 250 255	768
att aga aaa gcg att gtg ccc cag gat cca gac tgg tgg atc gtc agt Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp Trp Ile Val Ser 260 265 270	816
gcg gat tat tcc caa ata gaa ctc aga atc ctc gct cat ctc agt ggt Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala His Leu Ser Gly 275 280 285	864
gat gag aac ctt gtg aag gcc ttc gag gag ggc atc gat gtg cac acc Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile Asp Val His Thr 290 295 300	912
ttg act gcc tcc agg atc tac aac gta aag cca gaa gaa gtg aac gaa Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu Glu Val Asn Glu 305 310 315 320	960
gaa atg cga cgg gtt gga aag atg gtg aac ttc tct ata ata tac ggt Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser Ile Ile Tyr Gly 325 330 335	1008
gtc aca ccg tac ggt ctt tct gtg aga ctt gga ata ccg gtt aaa gaa Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile Pro Val Lys Glu 340 345 350	1056
gca gaa aag atg att atc agc tat ttc aca ctg tat cca aag gtg cga Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr Pro Lys Val Arg 355 360 365	1104
agc tac atc cag cag gtt gtt gca gag gca aaa gag aag ggc tac gtc Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu Lys Gly Tyr Val 370 375 380	1152
agg act ctc ttt gga aga aaa aga gat att ccc cag ctc atg gca agg Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln Leu Met Ala Arg 385 390 395 400	1200
gac aag aac acc cag tcc gaa ggc gaa aga atc gca ata aac acc ccc Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala Ile Asn Thr Pro 405 410 415	1248
att cag gga acg gcg gca gat ata ata aaa ttg gct atg ata gat ata Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala Met Ile Asp Ile 420 425 430	1296
gac gag gag ctg aga aaa aga aac atg aaa tcc aga atg atc att cag Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg Met Ile Ile Gln 435 440 445	1344
gtt cat gac gaa ctg gtc ttc gag gtt ccc gat gag gaa aaa gaa gaa Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu Glu Lys Glu Glu 450 455 460	1392

cta gtt gat ctg gtg aag aac aaa atg aca aat gtg gtg aaa ctc tct 1440
 Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val Val Lys Leu Ser
 465 470 475 480

gtg cct ctt gag gtt gac ata agc atc gga aaa agc tgg tct tga 1485
 Val Pro Leu Glu Val Asp Ile Ser Ile Gly Lys Ser Trp Ser
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<210> 39

<211> 494

<212> PRT

<213> Artificial/Unknown

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<223> Synthetic

<400> 39

Met Lys Glu Leu Gln Leu Tyr Glu Glu Ala Glu Pro Thr Gly Tyr Glu
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Ile Val Lys Asp His Lys Thr Phe Glu Asp Leu Ser Leu Lys Phe Leu
 20 25 30

Gly Tyr Lys Met Thr Ser Tyr Gln Glu Leu Met Ser Phe Ser Ser Pro
 35 40 45

Leu Phe Gly Phe Ser Phe Ala Asp Val Pro Val Asp Lys Ala Ala Asn
 50 55 60

Tyr Ser Cys Glu Asp Ala Asp Ile Thr Tyr Arg Leu Tyr Lys Ile Leu
 65 70 75 80

Ser Met Lys Leu His Glu Ala Glu Leu Glu Asn Val Phe Tyr Arg Ile
 85 90 95

Glu Met Pro Leu Val Asn Val Leu Ala Arg Met Glu Leu Asn Gly Val
 100 105 110

Tyr Val Asp Thr Glu Phe Leu Lys Lys Leu Ser Glu Glu Tyr Gly Lys
 115 120 125

Lys Leu Glu Glu Leu Ala Glu Lys Ile Tyr Gln Ile Ala Gly Glu Pro
 130 135 140

Phe Asn Ile Asn Ser Pro Lys Gln Val Ser Lys Ile Leu Phe Glu Lys
 145 150 155 160

Leu Gly Ile Lys Pro Arg Gly Lys Thr Thr Lys Thr Gly Ala Tyr Ser
 165 170 175

Thr Arg Ile Glu Val Leu Glu Glu Ile Ala Asn Glu His Glu Ile Val
 180 185 190

Pro Leu Ile Leu Glu Tyr Arg Lys Ile Gln Lys Leu Lys Ser Thr Tyr
 195 200 205

Ile Asp Thr Leu Pro Lys Leu Val Asn Pro Lys Thr Gly Arg Ile His
 210 215 220

Ala Ser Phe His Gln Thr Gly Thr Ala Thr Gly Arg Leu Ser Ser Ser
 225 230 235 240

Asp Pro Asn Leu Gln Asn Leu Pro Thr Lys Ser Glu Glu Gly Lys Glu
 245 250 255

Ile Arg Lys Ala Ile Val Pro Gln Asp Pro Asp Trp Trp Ile Val Ser
 260 265 270

Ala Asp Tyr Ser Gln Ile Glu Leu Arg Ile Leu Ala His Leu Ser Gly
 275 280 285

Asp Glu Asn Leu Val Lys Ala Phe Glu Glu Gly Ile Asp Val His Thr
 290 295 300

Leu Thr Ala Ser Arg Ile Tyr Asn Val Lys Pro Glu Glu Val Asn Glu
 305 310 315 320

Glu Met Arg Arg Val Gly Lys Met Val Asn Phe Ser Ile Ile Tyr Gly
 325 330 335

Val Thr Pro Tyr Gly Leu Ser Val Arg Leu Gly Ile Pro Val Lys Glu
 340 345 350

Ala Glu Lys Met Ile Ile Ser Tyr Phe Thr Leu Tyr Pro Lys Val Arg
 355 360 365

Ser Tyr Ile Gln Gln Val Val Ala Glu Ala Lys Glu Lys Gly Tyr Val
 370 375 380

Arg Thr Leu Phe Gly Arg Lys Arg Asp Ile Pro Gln Leu Met Ala Arg
 385 390 395 400

Asp Lys Asn Thr Gln Ser Glu Gly Glu Arg Ile Ala Ile Asn Thr Pro
405 410 415

Ile Gln Gly Thr Ala Ala Asp Ile Ile Lys Leu Ala Met Ile Asp Ile
420 425 430

Asp Glu Glu Leu Arg Lys Arg Asn Met Lys Ser Arg Met Ile Ile Gln
435 440 445

Val His Asp Glu Leu Val Phe Glu Val Pro Asp Glu Glu Lys Glu Glu
450 455 460

Leu Val Asp Leu Val Lys Asn Lys Met Thr Asn Val Val Lys Leu Ser
465 470 475 480

Val Pro Leu Glu Val Asp Ile Ser Ile Gly Lys Ser Trp Ser
485 490

<210> 40

<211> 24

<212> DNA

<213> Artificial/Unknown

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<223> Synthetic

<400> 40

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24

<210> 41

<211> 74

<212> DNA

<213> Artificial/Unknown

<220>

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<223> Synthetic

<400> 41

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60

agtgagtcgt atta

74

<210> 42

<211> 25

<212>	DNA	
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<400>	42	
	taatacgact cactataggg cgaat	25
<210>	43	
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<212>	DNA	
<213>	Artificial/Unknown	
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<223>	Synthetic	
<400>	43	
	gaatcgtcgt atgcagtgaa aactc	25
<210>	44	
<211>	25	
<212>	DNA	
<213>	Artificial/Unknown	
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<223>	Synthetic	
<400>	44	
	cttgattgac aaggatggat ggcta	25
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<213>	Artificial/Unknown	
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<223>	Synthetic	

<400> 45	
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<211> 29	
<212> DNA	
<213> Artificial/Unknown	
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<223> Synthetic	
<400> 46	
cggataacaa tttcacacag gatttaaac	29
<210> 47	
<211> 25	
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taatacgact cactataggg cgaat	25
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<223> Synthetic

<400> 49

tcccccggtg tgcgctcact gcccgcttcc cagt

34

<210> 50

<211> 34

<212> DNA

<213> Artificial/Unknown

<220>

<221> misc_feature

<223> Synthetic

<400> 50

agcttatcga tggcactttt cggggaaatg tgcg

34

<210> 51

<211> 35

<212> DNA

<213> Artificial/Unknown

<220>

<221> misc_feature

<223> Synthetic

<400> 51

agcttatcga taagcgatgc cgggagcaga caagc

35

B'
cont.